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Obtaining a Satisfactory Zinc Coating

Some Factors Affecting the Quality of Zinc for Hot Galvanizing—Why Iron Is Harmful and Lead Is Not

BY WALLACE G. IMHOFF

ONE of the best ways to obtain a high-quality zinc coating is through the use of a good, reliable brand of zinc for galvanizing purposes. This immediately brings up the question "what factors affect the quality of zinc for zincing?"

Metals may be of practical value because of their chemical composition or because of their physical properties. The American Society for Testing Materials has set a standard for the chemical composition of "Prime Western Slab Zinc," which is that such zinc shall not contain over 1.60 per cent of lead and 0.08 per cent of iron. Prime Western slab zinc is the standard zinc used for galvanizing.

By the time the zinc has reached the coating stage, that is, is hot, molten metal in the galvanizing pot, it contains other metals besides those set by the standards for such zinc. Some of these are put into the zinc purposely; others find their way into the metal during the regular daily operation of the galvanizing pot. It is of special interest to know about all the metals that are in the zinc, to know how they got there and to know what effect these metals have upon the quality of the zinc coating and the physical properties of the zinc.

Metals found in hot zinc in galvanizing baths are lead, iron, cadmium, aluminum, tin and, occasionally, antimony. Only two of these, lead and iron, are mentioned in the standards for prime Western slab zinc. So it is seen that in some cases it has been thought not undesirable to put other metals in, and in other cases it has been found impossible to keep other metals out. Some of the metals are present in large quantities; others are present in very low percentages. The important thing to know is what metals are present and in what quantities.

Since zinc is present in the largest quantity, it is only natural to ask "Is it possible to galvanize with pure zinc?"

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In the years following he became actively engaged in the practical operating end of the blast furnace, the basic open-hearth furnace and the electric furnace. After 16 months as a lieutenant in the Air Service, Mr. Imhoff again resumed his work in the steel business as assistant to the general superintendent of an Eastern steel plant.

In 1920 he became research engineer for the Sheet Metal Ware Association of New York and Buffalo, investigating the field of hot galvanizing for 15 large steel companies. This work was carried on for five years at Mellon Institute of Industrial Research, University of Pittsburgh. The investigations included all the troubles that the practical galvanizer is likely to encounter, as well as improved methods in galvanizing. A number of patents were taken out, including one in the field of electric galvanizing.

One of the best practical galvanizers in the country once remarked that the zinc in use was too pure for galvanizing purposes. There at least is still some doubt as to whether spangles can be obtained when pure zinc is used.

It is of interest perhaps to mention briefly some of the qualities of very pure zinc, the purest sheet zinc available. This zinc contains considerably less than 0.1 per cent of impurities. The cost of such metal is, of course, so high that it would be impractical to use it for commercial galvanizing purposes, even in a small way.

A sheet of this metal was found to be soft and ductile. It could be easily bent back and forth without showing any signs of splitting or cracking at the bend. It was very difficult to dissolve this metal in acid as compared with dissolving ordinary samples from slab zinc suitable for galvanizing. Our photomicrograph of this pure rolled sheet zinc shows that the grains are very fine, having been mashed and broken in the rolling process. No other metals or impurities can be seen, even under the microscope.

To discover what would happen from galvanizing with pure zinc, experiments were made with one of the very best quality commercial slab zincs, as shown by the analyses of two samples below:

	Sample 1, Per Cent	Sample 2, Per Cent
Zinc	99.25	99.46
Lead	0.80	0.52
Iron	0.02	0.02

This was very pure zinc, although it contained considerable lead. Before any metallic additions were made, a large number of sheets were galvanized and very good spangles were produced on them. This shows that spangles can be obtained without the addition of aluminum or making other metallic additions to the bath. No additions were made to the bath for three days, and sheets were galvanized to discover what would happen under these conditions. In the photomicrograph of this slab zinc the large size of the zinc crystals shows that the metal was cast and not rolled. No impurities can be seen in the metal, although at a much higher magnification they would perhaps become visible.

After three or four days' operation the zinc began to show evidences of contamination with iron. It was noticed that a scum of zinc oxide was formed much more quickly over the surface of the bath. During the first day's operation the bath surface stayed bright and mirror-like, and when the sheets were drawn through it they were bright and had a good spangle on them.

Surface Oxidation Causes Trouble

In a couple of days, however, the surface became dusty looking, dull, and it was no longer possible to skim a bright mirror-like surface. As fast as the skimmer was drawn over the top the surface closed behind it, leaving a dusty, yellow surface through which to draw the sheet. Thus it is seen that, when no metallic additions are made to the bath, the surface quickly oxidizes after a few days of operation. It is also clear that spangles can be obtained by simply using zinc with no metallic additions, but for only a short period of time.

Hannah and Rhead* state that "pure zinc alone is incapable of producing a spangle." The zinc used here contained small amounts of lead and iron and may possibly have had a large enough quantity to develop a spangle. All metals have a skin and show surface tension, much the same as the skin on the surface of water. Pure zinc is no exception. The mechanism of the formation of the spangle seems to be that this skin breaks up into pieces on the surface of the galvanized iron, leaving some places bright and others dull. Thus pure zinc should give what is ordinarily known as a spangle.

But, from a practical standpoint, pure zinc will not give a spangle, for pure zinc quickly becomes contaminated with small amounts of iron. Also, the surface of the metal oxidizes quickly, producing a dull, powdered luster, which prevents the formation of the spangle. What really happens is that the metallic skin which produces the spangle is gone, and in its place are the very fine particles of non-metallic oxide. Therefore no spangle can form, because the material to form it is no longer there. It may be perhaps physically possible to obtain a spangle with pure zinc, but it is not possible from a practical standpoint, because the zinc cannot long be kept pure under practical conditions.

Why Lead Rarely Gives Trouble

Lead does not seem to be harmful in zinc, for two reasons: First, it alloys with zinc only in very small amounts; second, any excess lead over the amount that will alloy with the zinc settles to the bottom of the pot, and is entirely harmless from a galvanizing standpoint unless it becomes too deep. If lead were lighter than zinc, and thus came to the surface of the bath, it would quickly oxidize at zincing temperatures, and perhaps be harmful.

TOP Surface of a Slab of Commercial Slab Zinc High in Iron Content. This kind of metal is apt to be brittle and to decrease the resistance of the coating against corrosion

Hannah and Rhead added a considerable quantity of lead (sufficient to saturate the zinc and leave an excess) to molten pure zinc. They state: "It was found that a spangled coating could be produced readily, and that there was an optimum temperature for the production of spangle grains of maximum size. This temperature was found to lie about 30 deg. C. above the melting point of zinc. It cannot be absolutely fixed at a definite value for articles of varying mass, owing to the impossibility of deciding upon the average size of the spangle grains on a sheet, with sufficient definiteness."

They state that the addition of lead or bismuth facilitates the production of the spangle, but in the discussion

*"Crystallization Effects on Galvanized Iron," by J. Dickson Hannah and E. L. Rhead. *Journal of the Institute of Metals*, Vol. XXX (1923), page 93.

of their paper John Welding said that he had never found it necessary to add lead to the galvanizing bath.

It was also interesting to note what J. Garland, Cossipore, India, had to say in regard to lead in the zinc bath. He was interested to note the conclusion that the presence of lead was necessary to the production of the spangle. He found that on pails dipped at a temperature of 890 deg. Fahr. the spangle was most pronounced, and he had come to the conclusion that the dipping temperature was the chief factor for its production. But since reading the authors' paper, he had looked up the analyses reports of the zinc used in his work, and found that it contained 1.9 per cent lead.

PHOTOMICROGRAPH of Very Pure Commercial Slab Zinc Used for Galvanizing Purposes. This is not so pure a metal as that shown in the other view on this page, but it is thoroughly satisfactory to use and is financially practicable

Discussions of other authorities on galvanizing have shown that, from the practical standpoint, lead has not been found to be harmful in zinc. The objections to large quantities of lead from a practical angle have been due to price, and to the fact that it settles to the bottom of the kettle. This raises the dross up into a level at which the articles galvanized must pass through it, thereby keeping the dross stirred up and producing a very inferior, low-quality coating. It is not uncommon in practice to have to dip out excess lead when this happens.

Difficulties Caused by Iron

Iron, the third impurity found in zinc for hot zincing purposes, is by far the most important. The limit set for iron by the American Society for Testing Materials is 0.08 per cent. Most of the practical galvanizer's troubles come from iron in the zinc. Hence some explanation is necessary to account for the difference between this very low percentage in the metal, as bought, and the high percentages of iron found both in the molten zinc bath and in the galvanized coatings.

Iron, although specified low in the standards, at times may be high in slab zinc. This was found to be true by most galvanizers during the war period, and for a few years after the war. At present, however, most of the slab zinc on the market meets the requirements of the standard set for metal for this purpose. But it is only a matter of good business policy to check up all the slab zinc when it is received.

Physical appearance and chemical analyses will quickly show the quality of the metal. These facts are best illustrated by an example of a large shipment of slab zinc that did not meet the standard. This metal was prime Western zinc, and not remelt zinc. It is not to be inferred, however, that most of the slab zinc on the market today is of low quality, because exactly the opposite is true; most of it is well within the limits set as a standard.

Deleterious Metal Easily Detected

The purpose of this illustration is to show how a high iron content affects both the physical and chemical qualities of slab zinc, and how it may be detected. All slab zinc should be analyzed according to the method given by the American Society for Testing Materials as a standard for sampling and analyzing slab zinc.

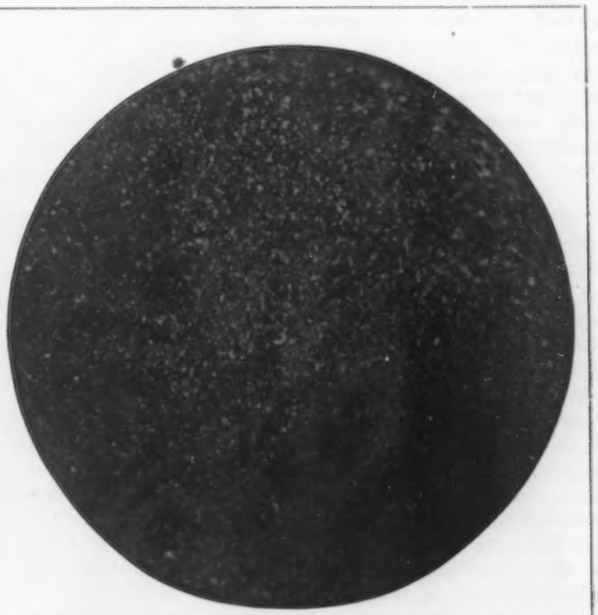
After doing this and finding the zinc not up to standard, it was decided to check the results by some additional samples and analyses. Our third illustration shows the top surface of one of the slabs of metal. The metal was not all like this, and the strange part of it was that other slabs, without this crystallization, were even higher in iron content. That the iron had segregated to the middle in this slab is shown by the analyses of two samples from this crystallized area.

	Per Cent Iron
Sample 1	0.238
Sample 2	0.255
Average	0.246

Attention was then turned to the better looking area of the slab, which appeared to be composed of purer metal. Samples from these areas showed the following results:

	Per Cent Iron
Sample 1	0.0952
Sample 2	0.0535
Sample 3	0.0714
Sample 4	0.0416
Average	0.0654

Thus is can be stated definitely that the chemical composition of the zinc does affect its physical appearance and fracture, for the average of the two samples drilled in the poor-looking area was 0.246 per cent iron content, as compared with 0.0654 per cent iron content for the clear crystalline area. This difference in the appearance of the fracture of the slab through these two areas was easily detected, also. Iron in zinc has the tendency to give the metal a brass-yellow color and to give the grain a fine, sandy ap-



PHOTOMICROGRAPH of Pure Rolled Sheet Zinc Containing Less Than 0.1 Per Cent of All Other Metals. This material is too expensive to be used for commercial galvanizing

pearance. Pure metal has a bluish luster and large, bright crystals. Zinc high in iron is very brittle; pure metal is somewhat ductile.

Other slabs were drilled and the average of all showed high iron content. It was found after going over many slabs that, first, the physical appearance is affected by the chemical composition of the zinc; second, the most highly contaminated part of the metal is found toward the center of the slab; third, iron gives the zinc a fine, sandy fracture and a light brass-yellow discoloration; fourth, pure metal is highly crystalline and has a bluish luster, and the surface of the slab is smooth and clean.

With a good, high-quality prime Western zinc, it takes from two to three weeks to saturate the metal with iron so that dross will settle out. If the kettle is overheated this will occur, of course, much sooner. Iron tends to make the coating brittle and to decrease its resistance to corrosion.

Cadmium is found in some zincs and has not found favor, especially from the sheet galvanizers. It tends to produce very fine, small spangles, which in themselves are not attractive.

Aluminum has been put in the zinc bath for some time and is very desirable when the bath is open—that is, not entirely covered with molten sal-ammoniac flux. It tends to give the coating a bright appearance, and keeps down excessive oxidation of the zinc. It is very desirable in obtaining a good spangle.

Tin, also, has been used for some time by the sheet galvanizing industry, and it is the tin that develops the large spangle on sheets.

Antimony often finds its way into the zinc bath, due to the charging of scrap metal into the galvanizing pots. It tends to make the coating brittle and will cause considerable trouble by giving a yellow discoloration on the sheet, if put in in too large amounts.

Cooperative Investigations on Die Castings

High Melting Brasses, Aluminum-Base Alloys, and Low Melting Zinc-Base Castings Studied in England

BRITISH die casting industry (according to speakers before the Institute of Metals, Liverpool, Sept. 5) suffered a serious setback as the result of bad work a generation ago, and buyers are still skeptical about its ability to furnish castings of uniformly high quality. In view of the resulting stagnant condition, leading firms organized a research into certain phases of the technical situation, and some of the results attained during the past four years were presented before the meeting mentioned. Representatives of the industry present at the meeting freely acknowledged that a considerable improvement in practice had resulted from these investigations.

High-Speed Steel Dies Favored

Although the question of metals for dies was not intensively studied, much discussion centered on this matter. Suitability of various steels for molds and cores when casting copper-rich alloys were investigated by agitating samples in the melted alloy for one to three hours. Marked differences in attack were noted. High-carbon steel and heat-resisting steels were little corroded, but soft and mild steel were rapidly attacked. Chromium plated steel resisted attack excellently, but the plating tended to flake off as a result of alternate heating and cooling. No comparative figures were given for cast iron, from which permanent molds are frequently made in England. Some heat-resisting irons have been investigated by the Cast Iron Research Association and had successfully been used for severe service. From the discussion it appeared that high-speed steel is favored for dies for the industry, although it was noted that one steel from one source might act very differently from a similar steel from another manufacturer. Another speaker emphasized the important part played by the die designer and tool maker; the commercial success of more than one firm depended upon the development of a staff of such highly-skilled specialists.

A more extensive investigation was made into the properties of aluminum-base castings, made in permanent molds without pressure. Castings studied were

4 per cent copper
8 per cent copper
12 per cent silicon
4 per cent copper, 3 per cent silicon
"Y alloy" (Cu : Ni : Mg 4 : 2 : 1½)
"L-5" (Cu : Zn 3 : 13)

Satisfactory results were obtained in both test bars and tubular flanged forms except for the first two mentioned. Hot shortness was thought to be responsible. In a supplementary investigation the impact strength of these alloys was found to be unimpaired at temperatures up to within 45 degrees of commencement of melting. Shrinkage cavities in some castings were controlled by close regulation of the mold temperature, although it was admitted that a change in mold design might have had a similar effect. One of the speakers asserted that tensile strengths reported for the 12-per cent silicon alloy were at least 2000 lb. below what he would regard as good works practice. Dr. Rosenhain said this occurred rarely; nearly always the complaint is that the laboratory can get better results with refined control.

Sixteen zinc-base alloys, having copper and tin, or copper and aluminum (plus further additions of nickel, cadmium, lead or magnesium), were studied in the form of test pieces made in pressure machines operated by hand. It was found that porosity depends almost entirely on the kind of pull given the lever, although this effect is minimized with wide gates. In sound test pieces the tensile strength is little affected by reasonable changes in casting conditions. Such castings were tested after accelerated aging (exposure to hot moist air or steam). It was found that chemical variations in the compositions studied had insignificant effect on rate of growth as compared with the form and mechanical condition of the casting itself. From a practical standpoint, a manufacturer of these low melting alloys declared that the casting temperature, temperature of mold, size of gate and vent, and type of pull, were all important variables, but they depended on the size and character of the casting. It is axiomatic that the metal should be at as low a temperature as could be conveniently worked, and that the mold should be cool enough to promote ready solidification, yet warm enough to allow the whole of the metal to get in before it began to solidify. In view of the complicated form of die castings, no standardized gate could be adopted. The type of pull of the lever operating the plunger is doubtless important, and varies with the skill of the workman. It is being found that the more viscous alloys of zinc-aluminum-copper could be cast in the same conditions as the pressure die castings in aluminum and aluminum alloys most successfully.

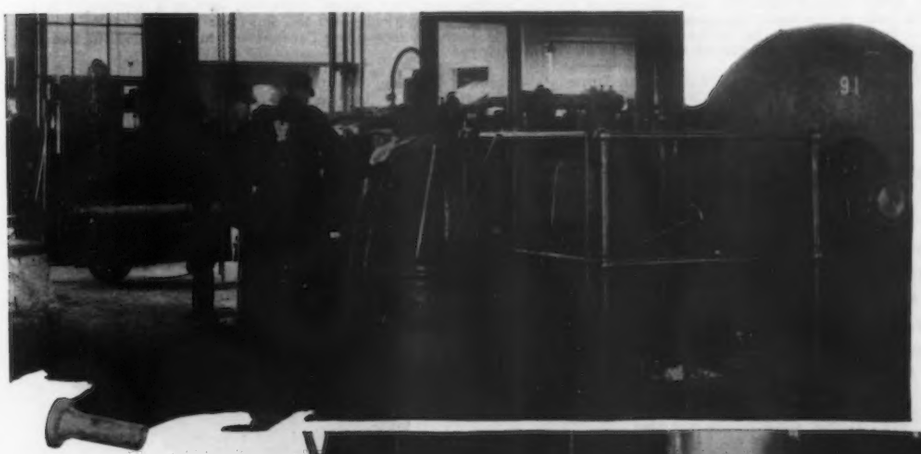
Gear Blanks with Minimum Waste

New Method Places Toughest Part of Bar Where Teeth Will Be Cut, Thus to Promote Strength

BY C. A. McGRODER

UNIFORMITY of grain structure where it is most needed and a minimized waste of material are the outstanding improvements effected by a new method of manufacturing bevel ring gear blanks, as developed and perfected in the forge department of Dodge Brothers Corporation, Detroit. Using 4½-in. chrome-vanadium steel bar stock, this new process, through a novel heading operation, turns the outside surface of the bar out and away from its center, until it lies at right angles to the original bar. This places the best of the metal, that portion of it which has been most refined in the rolling process, on the face of the ring blank, where the teeth will be cut. It also leaves the grain of the steel running in the general direction in which the teeth will be cut, straight out from the center of the ring, thus rendering the gear-cutting operation easier.

Earlier methods failed to produce uniformity of grain direction and structure and wasted a much higher percentage of the material in scrap. Most commonly used of these is a plan of piercing a hole in the center of a short section of round bar stock, after it has been flattened out to the required thickness and diameter. This leaves the



Under the Gravity Drop Hammer, or Board Hammer, at Right, Below, the Rough Ring or "Doughnut" Produced by the Horizontal Heading Machine Receives Several Blows Which Shape It into the Ring Gear Blank, with Slight Flashings on Both Inside and Outside. The crank-action trimming press at its left removes the flashings, after which the blank receives another blow or two under the drop hammer to insure accuracy of dimensions

Into This Heading Machine (Above) with 6-In. Capacity Are Fed Bars of 4½-In. Stock, 12 Ft. Long. The dies are in two positions, the first of which presses far into the heart, forcing the outside surface or "skin" of the bar to lie back in a circular flange, approaching the shape and dimensions of the rough blank or "doughnut." The next position brings the shaping of the "doughnut" nearer completion and shears it from the bar, leaving the new bar end with a deep impression in its center, which is the beginning of the next "doughnut"

At Right at Top Is the End of a 12-Ft. Bar After the Heading Machine Has Completed Its First Operation, Pushing into the Center of the Bar and Forcing the Outside Surface to Form One Side of the Circular Flange. This shows the side of the ring blank which will be composed largely of metal from the center of the bar. The metal from the bar surface forms the other side of the ring, where the gear is eventually cut. In the center is the remainder of the bar after the partly formed blank has been sheared off by the heading machine's second operation, leaving a depression in the center of the bar which is to be the hole in the next "doughnut." At left is the end of a bar worked down too short for the jaws of the heading machine. These rough ends are just large enough to be flattened out or "pancaked," to have the center punched out and to be made into two ring blanks by the process formerly employed

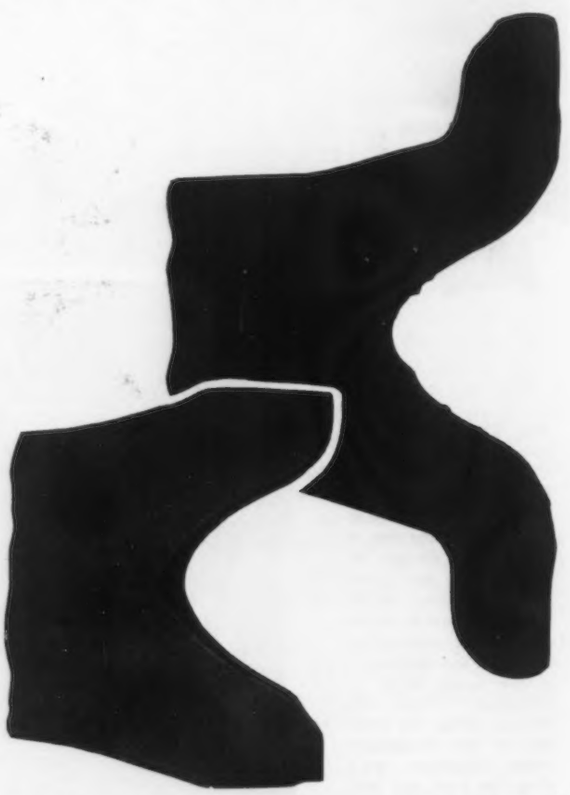
Four Stages in the Production of the Ring Blank After It Leaves the Horizontal Heading Machine. At the left is the rough "doughnut"—the partly formed gear blank turned out by the heading machine. Next is the same "doughnut" after it has received several blows from the drop hammer and still bears the flashings, which are to be removed by the trimming hammer. The two irregular circles are the flashings removed by the trimming press. The ring at right is the completed blank, ready for machining

better surface metal on the outside of the ring. In consequence the teeth are tougher near the outside diameter than they are at their narrower ends, on the inside diameter.

Another widely used method is to bend a piece of flat bar stock, which has been rolled to approximately the required shape, into a circle and then weld the ends together. Two shortcomings of this method are that the grain of the metal in the completed ring blank lies almost at right angles to the teeth that will be cut in it, and the characteristics of the metal (both chemical and structural) at the welding point differ widely from those prevailing elsewhere in the blank. Both of these conditions render more difficult the gear-cutting operation. A third method is to split a "buttonhole" lengthwise in a piece of round bar stock and then enlarge the opening until it approximates a circle. But this leaves, at opposite sides of the ring, two sections where the grain is irregular.

In the present method 12-ft. bars of 4½-in. round chrome-vanadium steel are used, containing 0.17 to 0.20 per cent carbon, 0.15 to 0.20 per cent vanadium and 1 per cent chromium. These are heated in an oil-fired furnace and fed into a 6-in. National heading machine, which is driven by a 75-hp., three-phase motor. Tests have shown that the unusually large flywheel with which this heading machine is equipped enables it to deliver momentarily over 300 hp. when the maximum pressure is developed in the upsetting operation.

Two operations are provided for by the dies of the heading machine—the first, upsetting; the second, shearing. The upsetting die punches into the center of the bar and mushrooms the stock out into a tulip-shaped, circular flange, with the more highly refined metal from the surface of the bar on its inside face, where the teeth of the gear will be cut. An air lift raises the bar from the first to the second position and the second operation shears the rough ring or "doughnut" from the bar, leaving a deep depression in the center of the bar, which is to become the hole in the next gear blank.



Etched Sections Showing Just the End of a Bar Going Through the Heading Machine. At left is the bar after the first blow from the heading die, which has punched into the center of the bar, forcing the surface metal out into a circular flange approaching the shape and size of the completed gear blank. This places the more highly refined metal from the bar surface on the face of the blank, where the teeth will be cut. At right the same bar has received the second blow from the heading machine, which helps to shape the ring blank and shears it from the bar

Etched Sections of Completed Ring Gears. The illustration at left shows the chief advantage of the new method. Here the grain of the metal lies in the best possible direction, straight out from the center of the ring, with the more highly refined metal from the surface of the bar in the teeth of the gear, where strain and wear are greatest. At the right the more highly refined metal from the surface of the bar can be clearly seen on the side away from the teeth. The "doughnut" used in this piece was intentionally placed face downward in the drop hammer, for experimental purposes

After being reheated in another oil-fired furnace the "doughnut" receives several blows under a 3000-lb. gravity drop hammer, or board hammer, which shapes it into the required dimensions of the ring gear blank, leaving only slight flashings on the inside and outside peripheries of the ring. While still hot the blank is placed in a crank-action trimming press, which removes the flashings. The trimmed blank is returned to the drop hammer, where it receives another blow or two under the forming dies to insure accuracy of shape and dimensions. So accurate are the dies of the heading machine, the drop hammer and the trimming press that the flashings removed by the press from a single blank weigh only 28 oz. This is practically all of the metal wasted in scrap by this new method, a remarkably small proportion.

Operators on the heading machine, which produces an average of 200 rough blanks an hour, find it possible to feed about 10 ft. of the 12-ft. bar into the machine while the regular gripping dies are in operation. The remaining short ends are allowed to accumulate until there is a large enough quantity on hand to make it worth while to fit up the machine with special dies adapted to gripping these short pieces.

But even with these special dies the heading machine is incapable of using up the bar to the end. A short length is left over, containing about enough metal for two more blanks. This is sawed into two pieces, which are flattened out under a drop hammer until they are about the thickness and diameter of the "doughnut" produced in the heading machine. A hole is punched in the center of each piece, which then is put under the drop hammer and trimming press, where it receives the same treatment given the "doughnuts" produced by the heading machine. The two small pieces punched from the center of these blanks add slightly to the amount of material wasted in scrap from each bar, but the waste for each ring gear produced is still much lower than that from any method of production previously used.

Aluminum Productive Capacity Rapidly Expanding

SUCH data as are available seem to convince a writer in "Mineral Industry, 1927," that world production of aluminum is steadily increasing, and is now in excess of 200,000 metric tons annually. The writer goes on to speculate just how far this increase is to go, and what the results will be. Fifteen years ago France and the United States produced almost all of the world's supply of bauxite, but since that time extensive deposits of high-grade bauxite have been developed in half a dozen different countries, and the production is now trebled, with the new producing areas furnishing over half the output. There has also been a corresponding increase in smelting capacity; the enormous new Canadian plant of the Aluminum Co. of America at Arvida, Quebec, went into production in 1926, and exports from Canada to the United States increased to 23,170 net tons in 1927 from 11,240 the year previous.

The most significant recent move in the world's market was the organization during 1926 of the Aluminum Cartel, which includes the principal European producers, thus dividing the field between the two forces, the cartel on the one hand, and the Aluminum Co. of America on the other hand, each controlling about one-half the world's producing capacity of metal.

These three factors—plentiful supply of bauxite, extension of smelting capacity and organized competition—may result in a marked increase in production and a corresponding lowering of prices. On the other hand, many users, particularly in the automobile industry, have been substituting steels of high strength and low corrodibility for aluminum at lower cost and with little increase in weight.

Figuring back from the value of new aluminum produced in the United States (Bureau of Mines figure of $39,266,000) and the average price of 25.4c. per lb., "Mineral Industry" says that 1927 production amounted to something over 150,000,000 lb. The plant at Massena, N. Y., contributed about half the production, the remainder coming from Niagara Falls, N. Y., Alcoa, Tenn., and Badin, N. C. Imports totaled 68,389,641 lb., while 16,051,477 lb. of ingot, plate and tube were exported.

The five aluminum plants operating in Norway have a rated capacity of about 26,000 metric tons of metal annually; the production in 1926 was 24,429 tons. In addition, two other plants, each of 10,000 tons capacity, are under construction, and the 7000-ton plant of the Norsk Aluminum Co. (controlled by the Aluminum Co. of America) is to be enlarged to 11,000 tons; this will bring the total capacity of Norway to about 50,000 tons annually.

Experiments with high-pressure steam locomotives have been hampered by the necessity for using turbines to generate the power with expensive intermediate gearing between turbine and driving axles. Nevertheless there has been in operation in Europe for over a year a "Schmidt-Henschel" locomotive generating steam at 1400 lb. per sq. in. in a tubular boiler, and delivering it at 900 lb. to the prime mover. The tubes are of nickel steel; distilled water is used for make up, and the engine has run about 30,000 miles without tube troubles. Another high-pressure locomotive of different design is also running on the Swiss railroads.

Electric Normalizing and Annealing

Eight Furnaces Handle Alloy Steels at Various Heating Cycles—Large Pit Furnaces a Feature—Air Blast for Cooling

ONE result of efforts by the Timken Roller Bearing Co., Canton, Ohio, to settle annealing questions raised by its production of alloy steels has been the installation of a bank of electric annealing furnaces that, individually and collectively, present several features.

The problem of utilizing electric heat in this particular case was complicated by a number of factors. Of these one of the most outstanding was the volume of production demanded. Another was that several different types of steel were made, each of which required a special annealing cycle and subsequent course of treatment. In fact, some of the factors involved threatened to make the general use of electric heat impractical, in spite of manifest advantages.

The difficulties were overcome, however, and a group of eight furnaces has been installed; they form a total connected load of 3600 kw. Two more are projected for installation in the near future that will increase the total to 5450 kw. As the furnaces have all been specially designed for their particular work, an individual description of the different types may be of interest.

Pit Furnaces for Slow Cooling

Probably the most remarkable of the group, in point of size and novelty of design, are the two 850-kw. pit annealing furnaces. These furnaces were specially built for annealing high-carbon chrome steel, or any other steel where the annealing cycle calls for a slow cooling. The long cycles required have, hitherto, been a decided obstacle to the use of electric heat for annealing such steels on anything approaching a quantity basis. In a well-insulated furnace the cooling time was usually so long that production was seriously delayed. In the case of these particular furnaces, this difficulty has been overcome by the introduction of a novel feature in the furnace construction.

Each furnace is 9 ft. wide and 21 ft. long inside, with a loading depth of 6½ ft., and accommodates charges of bar or tube stock of weights up to 50 tons. The covers are separately framed structures, weighing about 25 tons each, fitting in sand seals around the top of the pit. They are handled off and on the furnaces by a special electric traveling gantry crane running on tracks at the floor level on each side of the furnaces.

The heating elements are of the T-grid type, and are mounted on the side walls and bottom of the pit. They are divided electrically into two circuits, one including the side wall elements and the other those in the bottom. Each circuit is provided with individual control which gives two sets of connections, one a 440-volt, three-phase Y for high starting input, and the other, 440-volt single-phase series for soaking heat. The first has a power demand of 425 kw. for each circuit, or 850 kw. total, and the latter 142 kw. for each, or 284 kw. total. The charge is stacked in cradles, and loaded as shown in one of the illustrations, which also shows the method of mounting the resistors and the method of protecting them from damage during charging or discharging by means of heavy heat-resisting alloy guides.

Two 850-Kw. Pit Type Furnaces (Right) Used for Long-Time Annealing of High-Carbon Chrome Steel. Interior of the furnace and method of protecting heating units are shown above

Air Blast Accelerates Cooling

The operation of the furnace is briefly as follows: The material is brought up to annealing temperature (1450 deg. Fahr.) as rapidly as possible, at which point the circuit

The 700-Kw. Pusher Type Normalizing Furnace with Tubes Being Pushed Upon the Run-Out Table

is cut over from the Y connection to series, and the temperature is held long enough to insure uniform heating. The charge is then slowly cooled through its critical range, the process being carefully regulated to insure the exact metallurgical results desired.

After the critical range is passed, cooling is accelerated by means of an air blast system, which consists of a series of pipes built into the furnace through which cooling air is forced by means of two 20-hp. motor-driven high-pressure centrifugal blowers. It is this forced cooling system that has rendered long time annealing practical on a commercial basis in these furnaces. It has eliminated the possibility of exposing the charge to the air before it has cooled sufficiently, and, at the same time, it removes the objectionable feature of too long a cooling period. The total annealing time from charge to charge is just about cut in half by the use of forced cooling. A third 850-kw. pit furnace of the same general construction and operating principle, will be installed shortly.

Chrome Steel Normalized in Special Furnace

All high-carbon chrome steel is, before annealing in the pit furnaces, normalized in a 700-kw. pusher type normalizing furnace. This is also used to normalize certain low-carbon steels, and for processing steels that have to meet cold shear tests. It is 12 ft. wide and 21 ft. long inside, and is capable of handling bars up to 5 in. square and 20 ft. long, or tubes of corresponding dimensions. It is equipped with three pusher mechanisms, two being located at the charging end and one at the side. The latter was developed to push the charge across the width of the furnace interior from the charge to the discharge side. It consists of five rails crossing the furnace interior at equal intervals, and terminating on the discharge side in a large trough which delivers to a flight conveyor for returning the carrier shoes to the transverse pusher.

The actual pushing is done by a number of shoes, or baulks, in each trough, which are pushed across by the rods of the pusher mechanism proper. The charge rests on these shoes, and is carried across the furnace by the movement of the shoes in the trough. When the shoes come to the discharge side they are delivered to the conveyor and returned to the loading side for use. The pusher mechanism is so designed that the motor circuit is tripped at the completion of one revolution of the cams, so that the distance of movement is limited. The other pushers are of

Side Pusher Mechanism of the Normalizing Furnace That Shoves the Charge from the Charging to the Delivery Side. The conveyor which carries the shoes under the furnace for re-insertion can be seen in the right center

the rod type, and serve to push the charge in and out of the furnace, respectively.

The T-grid heating elements are mounted partly on the furnace roof, and partly in transverse wells located between the piers which support the cross pusher shoe troughs. Electrically, the heating elements are divided into four separate circuits, each with individual control.

The operation of the furnace is quite simple. The stock to be normalized is pushed in by a motor-driven pusher. By virtue of the electric connections that have been adopted, it is subjected to a high initial heat on entering, the degree of which is lowered as it moves across the furnace. Arrived at the finishing, or delivery side, the work is pushed out of the furnace onto a run-out table which is equipped with manipulators, which deliver it to a motor-driven cooling bed. From the bed it is delivered directly to the cradles in which it is to be loaded into the pit annealing furnaces.

The controls for all the motor-driven operations, including the side pusher, are located on the charging side so that the furnace can be operated by one man. Some idea of the method of control can be obtained from one of the illustrations. The capacity of the furnace is about 150,000 lb. of stock per day, with a power consumption of about 200 kwhr. per ton. An additional furnace for normalizing work will be installed later in the year. It will be rated at 1000 kw.

Normalizing Small Lots

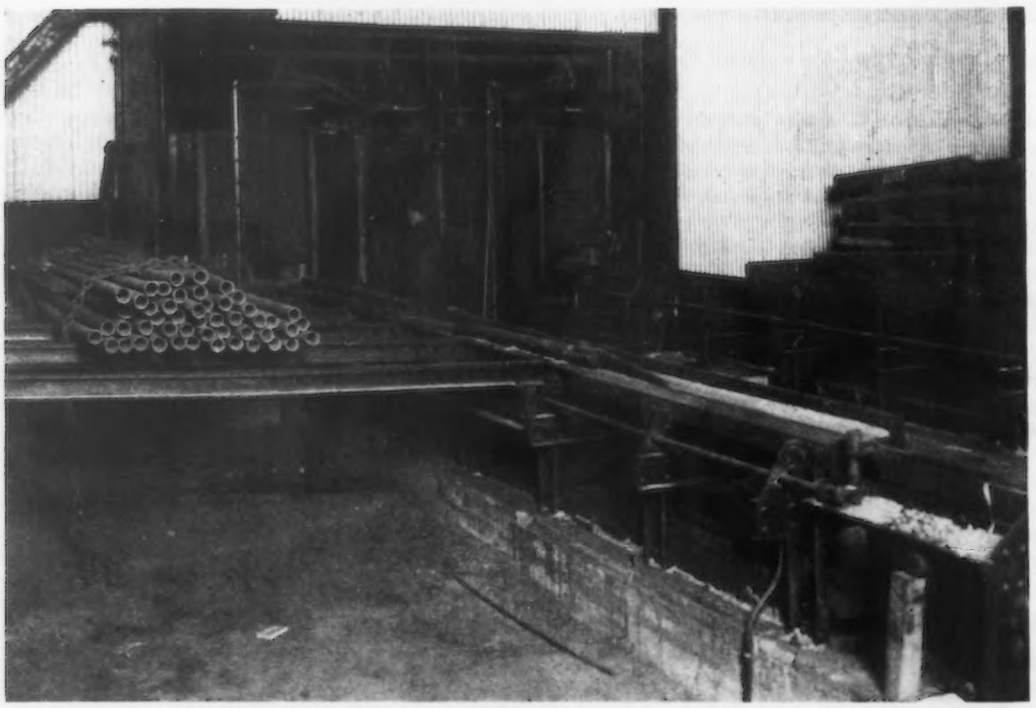
Heat treatment of bar or tube stock of various alloy steels is accomplished in a 300-kw. hearth type furnace. This furnace is also used for the normalizing of small lots of steel which it is impractical, for one reason or another, to handle in the large unit. The furnace is of the double end type, being about 20 by 6 by 4 ft. inside. The stock to be annealed is charged in at one door by a motor-driven pusher and, after it has been uniformly heated, pushed out of the other onto a receiving table. This table is tilted by another motor-driven mechanism, and the stock dumped into an oil-filled quenching tank. It is removed from the tank by a motor-driven conveyor.

In order to compensate for any local cooling that may take place at the ends near the doors, the heating elements have been grouped into three zones, two door zones, and a central or main zone. As to the mounting, part of the grids are mounted on the roof and part underneath the hearth, so as to produce a uniform distribution of temperature in the furnace interior, with a consequent even heating of the charge.

Two small circular pit furnaces have been installed for treating rod in coils. They are rated 100 kw. each and are separately supplied from 440/125 volt, single-phase transformers. They can be seen in an accompanying picture just to the right of the hearth type furnace just described.

Two Car Type Furnaces for Bar Stock

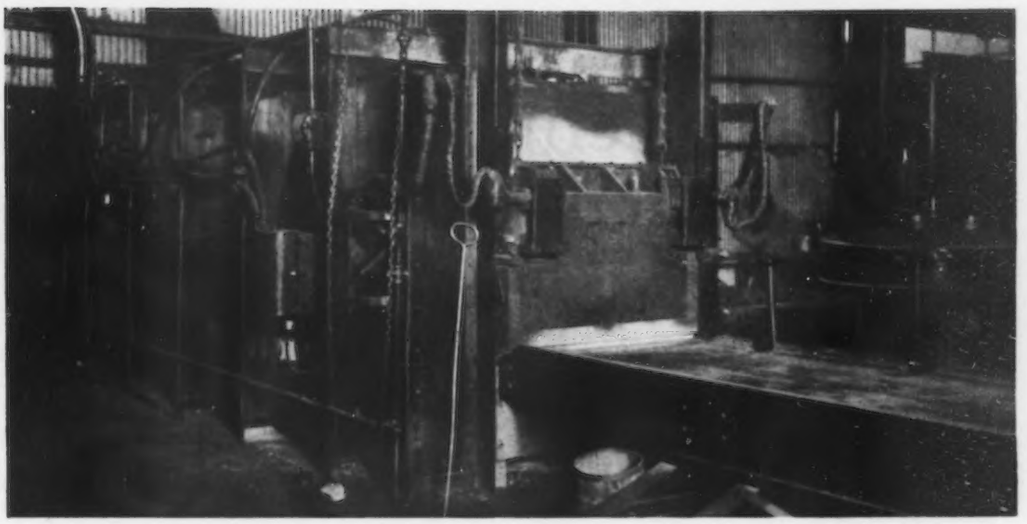
Miscellaneous bar stock, especially that which does not require annealing cycles of over 24-hr. duration, or which can be discharged into the open air at high temperatures, is annealed in two car type furnaces. One of them, a 315-kw. furnace, was built by William Swindell & Brothers, Pittsburgh. The inside dimensions are 22 ft. long, 6 ft. 4 in. wide and 5½ ft. high. The car dimensions are 20 ft. long, 6 ft. wide and about 3 ft. high. The normal rating of the furnace is 20,000 lb. per charge, but the car will carry a load of twice that, if necessary.



Normalizing Furnace from the Charging Side, Showing the Charging and Discharging Pusher Rods, and Their Control

The heating elements are mounted on the roof and side walls of the furnace proper, and on the car bottom. The latter is divided into 13 wells, by firebrick piers built up from the car bed. The elements are mounted in these wells, and the whole covered with interlocked alloy sheets that form the hearth. The elements are directly connected to the 440-volt, 3-phase supply circuit, two connections being available, 3-phase delta for high initial heat, and 3-phase Y for holding or soaking heat. Automatic temperature control is obtained by means of a Leeds & Northrup potentiometer type single point controller recorder. The average economy is 355 kwhr. per ton.

The car is moved in and out of the furnace by a motor-driven rack and pinion mechanism. Connection for the elements on the car body is made by a bushing and coupling located at one side of the door. A very elaborate system of sand seals has been adopted to prevent uneven temperatures in the furnace interior due to the leakage of air from the



The 300-Kw. Hearth Type Furnace Used for Heat Treating Bar or Tube Stock. The two 100-kw. circular pit coil furnaces can be seen in the right background

outside. The door is provided with a seal at both top and bottom, and there is a seal on each side of the car, which engages with a knife edge on the furnace wall. The furnace is also equipped with vertical cooling ports in the side wall, by which the rate of cooling can be accelerated if desired.

The second car type furnace, furnished by the General Electric Co., differs considerably in its design and construction. The inside working dimensions are 28 ft. long, 4½ ft. wide and 2½ ft. high, the overall sizes being 34 x 9½ x 16 ft. The car proper is 33 ft. long, 5½ ft. wide and has an overall height of 5¾ ft. It is equipped with a cradle which raises the charge above the lower level of the heating elements on the side wall.

The heating elements are all mounted on the side walls, there being none on the roof or on the car. They are divided into two zones, each with separate control. The design of the elements proper is such that extra heat is provided near the door to compensate for door losses. Their location on the walls brings the lower ends below the level of the charge on the car, so that heat may be radiated up through the charge. The furnace is supplied with power at 220 volts, each zone forming a separate circuit. Two connections are available for each circuit delta for high heat and a Y for soaking heat. The power consumption of the first is 230 kw. per zone, or 460 kw. total, and that of the other 153 kw. per zone, or a total of 306 kw. The furnace has a normal capacity of 10 tons but, like the other car type furnace, it has 100 per cent overload capacity. On a maximum heating cycle of 9 hr., the power consumption averages about the same as that of the other furnace.

High temperature insulation is the subject of a 20-page treatise prepared for distribution by Celite Products Co., Los Angeles, containing information whereby the loss of heat through various kinds of walls may be computed, and upon which an economical insulated design may be based.

A 315-Kw. Car Type Furnace (Right) Used for the Annealing of Stock Requiring Short Annealing Cycles

A 460-Kw. Car Type Annealing Furnace (Below)

Discuss Machine Tool User Problems

Lubrication, Hardness of Metals to Be Cut, Tooling Service, Fabricated Frames and Productive Capacity

WAYS and means of bettering machine shop practice and of meeting problems which confront the user of machine tools were discussed at the second annual meeting of the Machine Shop Practice Division of the American Society of Mechanical Engineers, at the Hotel Sinton, Cincinnati, Sept. 24 to 27. To the symposiums on aeronautic machine shop problems, on lubrication and on the use and application of machine tools in modern manufacturing methods were contributed seven papers by men selected as eminently qualified to speak on these subjects. A delightful trip on the Ohio River steamer Cincinnati to Ashland, Ky., to inspect the continuous sheet mill of the American Rolling Mill Co., constituted a novel departure from the routine procedure of most conventions. Three of the technical sessions were held on board the Cincinnati and one at the Hotel Sinton. About 275 members and guests registered at the meeting, and of this number 225 made the journey to Ashland.

Theory and Practice of Bearing Lubrication

FROM the standpoint of arousing controversial comment the paper by Forrest E. Cardullo, chief engineer G. A. Gray Co., Cincinnati, presenting "A Theory of the Lubrication of Cylindrical Bearings," was outstanding. After building up his theory, Mr. Cardullo deduced from it certain general considerations regarding the design and operation of bearings. Assuming, as seems reasonable, that the minimum film thickness is the most important of the factors which determine whether or not a bearing will operate successfully, he arrived at the conclusions embodied in the following general rules:

1. The load-carrying capacity of a bearing is proportional to its diameter. 2. The load-carrying capacity is proportional to the operating viscosity of the lubricant, that is, to the viscosity of the lubricant at the temperature which the lubricating film attains in operation. 3. The load-carrying capacity is proportional to the speed of rotation in revolutions per minute. 4. The load-carrying capacity is proportional to the surface speed of the journal, since this is proportional to the product of the diameter and the speed in revolutions per minute. 5. The load-carrying capacity of a bearing is a function of its length: For very short bearings, such as eccentric straps, it is proportional to the cube of the length. For very long bearings, it is proportional to the length. For bearings of the usual proportions, the load-carrying capacity is proportional to some power of the length greater than the first and less than the third.

6. The power loss in a bearing is proportional to the square of the diameter. 7. The power loss is proportional to the length. 8. The power loss is proportional to the square of the speed in revolutions per minute. 9. The power loss is proportional to the square of the surface speed of the journal. 10. The power loss is inversely proportional to the operating clearance. 11. The power loss is proportional to the operating viscosity of the lubricant.

These rules, said Mr. Cardullo, lead directly to the following conclusions regarding the ultimate rise in temperature of a bearing operating continuously: The rise in temperature of a bearing is independent of its length; is proportional to its diameter; is proportional to the operating viscosity of the lubricant; is proportional to the square of the number of revolutions per minute; and is inversely proportional to the running clearance.

Mr. Cardullo pointed out that these rules assume certain conditions which never are realized in practice—that the box and the journal are both truly round and perfectly smooth, that they are rigid and maintain their shape, and that their axes are parallel and are not affected by deflections produced by the load. In fact, the rules formulated are indicative merely of the general trend of the behavior of bearings.

Lubrication Grooves in Bearings

In a paper on "Grooving Bearings in Machines," G. B. Karelitz, research engineer Westinghouse Electric & Mfg. Co., East Pittsburgh, said that a large number of machine bearing troubles would be eliminated and wear would be decreased were more attention paid to the fundamentals of lubrication during the design of machines. Viscosity alone cannot be relied upon as a test for a good lubricant. Its oiliness is just as important, as this property greatly decreases friction between the surfaces in contact. Furthermore, the oiliness apparently determines the ability of the lubricant to adhere to the rubbing surfaces, which is essential for maintaining an efficient load-carrying oil film.

The mechanical design of a bearing must be developed with the importance of fluid lubrication kept always in mind, Mr. Karelitz declared. The lubricant must be fed into the bearing at a point where the pressure of the oil is low or even preferably where a vacuum is expected, as on the "up-side" of a sleeve bearing. It is important to leave uninterrupted the bearing zone, where the load-carrying oil film is formed.

Indiscriminate cutting of grooves in a bearing may be harmful. The function of grooves is primarily to distribute oil from the source of supply over the complete length of the bearing. Wherever possible, they must be confined to the unloaded portion of the bearing; the loaded part should be left free from interruptions. It appears that an angle of about 45 deg. to 60 deg. must be had between the line of oil admission and the load line to allow building up an efficient load-carrying oil film.

While an essential feature of fluid lubrication is a continuous rotation of the journal in the bearing at a comparatively high speed, unfortunately in many instances this condition is not fulfilled, said Mr. Karelitz.

How Railroads Use Their Machine Tools

LARGE sums of money are spent annually by railroads in making changes in machine tools and in shop surroundings, to keep up with the increased areas and weights of parts to be machined and maintained, said L. A. North, shop superintendent Illinois Central Railroad, Chicago, in a paper dealing with "Machine Tools—Their Use and Application in the Railroad Industry." He declared that the number of parts to the locomotive, as well as weights, are increasing constantly. This fact makes it necessary to establish new methods and higher production to maintain costs at a satisfactory level. In this direction many shop kinks have been developed by officers and by shopmen, while machine tool builders also have made valuable suggestions. Mr. North emphasized that the "man factor" is an important consideration. If the workman can be induced to realize the necessity for proposed changes, and to become interested in

future betterments, his efforts will enter largely into the further advancement of this undertaking.

Explaining the attitude of the railroad toward introduction of new tools and new methods, Mr. North observed that the "field for external and internal grinding has been developed to some extent. Many parts formerly turned, planed or slotted are now finished in a far shorter time by grinding. Metal is saved, which in itself adds to the life of the part being machined." Piston rods, air reverse cylinders, air fire-door opener cylinders, grate-shaker cylinders, stoker engines, crank pins and driving axles are among the parts which are being ground, instead of being machined by some other less efficient and less satisfactory method.

Mr. North pointed out that "some thought has been given to tire grinding, also some experimental work has been done on reducing flat spots on car wheels. Unless a very small amount of metal were to be removed, tire grinding would not interest railroad management, as grinding on the flange would slow up this operation compared with machine turning and would destroy any saving that otherwise would be effected." Grinding of locomotive cylinders and of piston-valve bushings would furnish a smoother surface than the present method. Increasingly, grinding will be used for future operations, as machines are designed for that purpose.

Milling machines are taking a prominent part in railroad shop practice, according to Mr. North. Further development of millers can be brought about and production can be increased and cheapened by a closer study of machine-work needs, the tool builder keeping in mind the introduction of harder and tougher metals employed in locomotive construction. In regard to drilling operations, there is slight use for the full radial. Such angle drilling as is necessary can be done either on the semi-radial drill or on vertical drill presses with tilting tables. When multiple-spindle drills are utilized, they should be fitted with a simple and suitable chuck for rapidly clamping and securing parts to be machined.

Special chucking features and forming tools used in conjunction with high-speed tools and specially designed heavy-duty machines have reduced machining time, have enabled railroad shops to keep pace with the increased areas and parts to be machined, and have relieved the fatigue of the operator and added to his personal comfort.

In turning bar stock from which cap screws, hex-head machine bolts, studs and other parts are made, Mr. North said that close study is required, to avoid spending money for waste material, which otherwise would be saved in labor if this operation were used. The time reduction by means of a special chucking feature has been substantial on this one class of work, the saving probably running as high as 10 per cent. Lapping and honing are of interest to railroad machine shops only in regard to machining airbrake parts.

Tractor and Implement Makers' Use of Machine Tools

MANY machine tool builders unfortunately think that their customers do not understand how to use machine tools effectively and that the ideas of the customers are untenable if in contradiction to the broad experience of the machine tool manufacturer, said Max Sklovsky, chief engineer Deere & Co., Moline, Ill., in discussing "Machine Tools in the Implement and Tractor Industries." Undoubtedly many users of machine tools are ignorant of many of the problems in the design of the equipment; nevertheless, machine tool makers would profit by taking note of the actual experience of machine tool users.

Machine tools used in the manufacture of implements today represent an investment of $200 per employee, while other production machinery averages $2,500 per employee. On the other hand, the unit machine tool investment in the tractor industry is about $1,500, or seven and one-half times as great as in the implement industry, whereas other production machinery is approximately $1,000 per employee. These figures, according to Mr. Sklovsky, justify the statement that the present-day tractor is largely a machine shop product.

The tendency is to apply machine tools to a greater degree in the manufacture of implements, because machined steel parts are being substituted for castings and cut gears for cast gears, while ball and roller bearings have become necessary, to provide increased resistance to wear. All of these changes call for more careful machining. Precision of manufacture applies not only to the tractor, but also to the implement. Machine tool manufacturers, therefore, can look forward to the greater use of machine tools by implement builders. However, implements require forging machines rather than machine tools, and machine tool builders cannot expect to find as large a market in the implement industry as in the tractor industry.

Greater Ruggedness Now Required

Protection of wearing parts, principally the various bearings, and their proper lubrication are two factors essential in good machine tools today, declared Mr. Sklovsky, who further stated that machine tools must be built not only for rapid production, but also with rigidity and strength far beyond the standards of a decade ago. Interchangeability of wearing parts is more desirable than their repair, and on this account ball or roller bearings properly adapted are preferable to solid bearings.

Rigidity of machinery where chiseling tools are used is universally recognized as essential, but many designers have overlooked one element of rigidity—that of the joints! Parts of machine tools are most generally designed with sufficient rigidity, but the fastening of these by means of bolts or studs is usually insufficient. Therefore, declared Mr. Sklovsky, "look to your joints" would be a valuable slogan for machine tool designers.

Chatter is the most serious drawback in obtaining proper results from machine tools, he said. Any such detriment inherent in the construction can be and should be overcome by machine tool builders. When this defect is eliminated, users can readily look to the design of their own product and parts, and to the condition of the materials used therein, for the elimination of further difficulties with machining operations.

Standard Machines with Special Fixtures Give Flexibility

"MOST of the equipment which we install must be suited for general conditions, and yet be adapted to high production," said J. R. Weaver, superintendent Manufacturing Equipment Department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., who took as his topic "Some Practices in the Use of Machine Tools in the Electrical Industry." He declared that work in the electrical business is so diversified that standard machines with special holding fixtures are used extensively. Another way to attain reduction of costs has been to arrange several machines in sequence in charge of one operator.

While the Westinghouse company believes that fixtures should be designed and built by the manufacturer of the machine tool, and installed on it during its process of construction, such practice has been inconvenient because it delays delivery of the machine. However, in building its own fixtures, the company endeavors to take advantage of machine tool builders' experience.

Choosing the Tool for a Given Job

Mr. Weaver expressed the opinion that "on some work, especially on form surfaces, planing is much more economical than milling, for the reason that we can maintain our form and size with the least expenditure. However, on flat surfacing, especially where there are a lot of pads to be finished, the milling machine is better adapted than the planer. We do considerable surface grinding on castings, and we find this to be a very economical way of finishing

surfaces, providing there is not more than ¼ in. of metal allowed for the finish."

Since all manufacturers are reducing as far as possible the amount of finish on their castings and forgings, Mr. Weaver said, it looks as though, if this trend continues, some time in the future the equipment will be of lighter construction, of high speed and easily handled, depending on the development of cutting tools. It is hard to predict just how much improvement can be obtained from redesigning machine tool equipment, but it appears as though manufacturers have gone as far as possible, so that users must turn in other directions rather than to machine tools to realize further savings in production costs.

Suggests Fabricated Machine Frames

Mr. Weaver said that his company has gone extensively into welded fabricated steel construction work on its apparatus, and suggested that it might be possible, to some extent at least, to apply the same construction to machine tools. He explained that the company has gone into this construction on jigs and fixtures and has reduced costs and has advanced deliveries about three weeks on each jig. He mentioned the fact that Westinghouse has been experimenting with some special alloy steel on which cutting speeds and certain other operations have been increased as much as 250 per cent, with good results. This special alloy steel, combined with fabricated steel construction, would mean that machine tools ought to be built for and run at a much higher speed than at present.

The company's experience in applying chromium plating to cutting tools shows that, on cutting materials other than metals, the process has been successful; but, when cutting steel and cast iron, the plating chips off at the cutting edge.

For handling alloys of aluminum, copper, brass and zinc, Mr. Weaver's company has set up three processes: 1. Die casting, by which castings are made from zinc-base alloys and aluminum. 2. Permanent molding, by which castings are made from iron aluminum bronze, or aluminum alloy. 3. Hot pressing, which is used on castings or forgings designed from forged brass or copper. The utilization of these processes has aided substantially in reducing, as well as in some cases entirely eliminating, machining.

Production Per Man-Hour Dominates in Automobile Plants

SPEAKING for the automobile industry, L. L. Roberts, mechanical superintendent Packard Motor Car Co., Detroit, in a paper read in the author's absence by H. K. Parsons, Cincinnati Milling Machine Co., Cincinnati, declared that "production per man per hour is of more importance in the selection of a machine than floor space, but economy in the use of floor space is desirable. A machine of compact design has many advantages over one with projecting arms, brackets and levers, which make the latter type difficult to place in a progressive lineup as well as liable to damage in transportation."

Individual motor drives are preferred to belt drives, although the former are more expensive and cost probably as much to maintain. However, the individual motor drive shows a saving in power consumption, presents a clean-cut appearance and lends itself readily to the installation of conveyor chutes, etc., for the transportation of parts in process. Hopper feeds are desirable and should be installed wherever the design of the part will allow their use without too many complications in the design of the hopper feed mechanism.

Extensive Repairs Not Favored

It is not the policy of the Packard Motor Car Co. to repair machines where the cost of repairing is over half of the purchase price of a new machine. Extensive repairs are made only when the machine is of a special type and therefore would have a small resale value, and where the purchase of new equipment would show no substantial saving.

Answering the question of what actuates the purchase of new equipment, other than for purposes of expansion, Mr. Roberts replied that "it has been the general policy of the Packard Motor Car Co. to purchase any single machine or battery of machines which, when all the factors involved in the manufacturing costs are computed, shows that it will pay for itself within a reasonable length of time through its greater efficiency."

The speaker said that too much stress cannot be laid on the importance of proper tooling in regard to cutting tools, holding jigs and fixtures. The cutting tool set-ups should be made so as to allow for quick removal from the machine. The piping installation carrying the coolant to the cutters should be made to be readily detached or moved, to facilitate its adjustment and replacement. Holding fixtures should be so designed as to make it possible to clear chips from their locating and clamping points with the smallest amount of time loss, after the removal of the part being machined.

Who Should Provide the Tooling?

With regard to the problem of whether a prospective machine tool user should purchase a machine with complete tooling, or should buy only the machine and tool it up with the aid of his own tool engineers, Mr. Roberts explained that his company's practice has been to have machinery builders submit complete proposals covering the tooling and the methods by which the operations are to be performed. Advice is usually given in advance by the company as to the general requirements of production, quality of finish, tolerances, previous operations performed and the locating points to be used.

Certain parts difficult to clamp without springing under the cut, on account of the nature of their design, have been considered more suitable for machining on a surface grinder than on a milling machine. Such parts as stamped crankcase gear covers, side wheel carrier brackets, exhaust and inlet manifolds, rear axle cases, motor inlet and outlet water flanges and rocker lever housings have been economically machined on this type of grinder. Many parts were ground for one-half of the former cost of milling.

Radical departures are often made from long-accepted methods of machining motor parts on account of some machine tool improvement, said Mr. Roberts. "As an example: there are eight balance counterweights assembled on a Packard crankshaft. Three counterweights formerly were forged, machined on two flat sides and joint side by surface grinding, and then contour turned in a lathe to a radius approximately the same as the crankarm, with a special fixture holding eight of the parts. As 2000 of these parts were required daily, this method was quite costly and needed four grinders and two lathes. Two high-powered milling machines with hydraulic feeds are now used instead; one machine is for cutting the weights to length, 16 at a time, from rolled bar stock, and the other machine is for form milling the radius formerly turned in lathes. These two machines easily produce 2000 counterweights in a 9-hr. day."

Inspection on Aircraft Engines

In the manufacture of Wright aircraft engines, inspection is of paramount importance, said Hugh W. Roughley, quality manager Wright Aeronautical Corporation, Paterson, N. J., in a paper on "Inspection Methods and Quality Control in the Manufacture of Aircraft-Engines Parts," which was read by L. C. Morrow. From the time the raw material enters the factory until the finished engine is finally tested and packed for shipment, all materials and every operation are subjected to the exacting scrutiny of a large force of specialists.

Commenting on Mr. Roughley's paper, R. E. Flanders, manager Jones & Lamson Machine Co., Springfield, Vt., observed that the large number of alloy steels going into Wright motors is of interest. In fact, the wide range of materials may be partly responsible for the improvements in airplanes. If so, it is an indication that standardization of materials should not be carried too far.

Tool Makers Must Guard Supremacy

That one-half of the machine tools bought by his company do not give the accuracy assured by their guarantee

was the statement of J. E. Padgett, Spicer Mfg. Co., Toledo, Ohio, in the discussion which closed the final technical session. He stressed the point that few machine tool salesmen know their own product as they should.

Progress in European Machine Tools

Engineers in European countries are profiting by the things being done in an industrial way by the United States, declared Fred A. Geier, president Cincinnati Milling Machine Co., in a short, informal talk. Mr. Geier, who has just returned from Europe, said that there is still need for more careful planning and designing of machines in this country. He emphasized that Americans should abandon the idea of the supremacy and invulnerability of their machine designs. At the recent British machine tool exposition he noted evidences of considerable improvement in British tools.

R. E. Flanders, manager Jones & Lamson Machine Co., Springfield, Vt.; L. C. Morrow, managing editor *American Machinist* and chairman of the Machine Shop Practice Division, A.S.M.E.; and Walter W. Tangeman, sales manager Cincinnati Milling Machine Co., presided at the technical sessions. The local committee on arrangements consisted of Mr. Tangeman, chairman, E. F. DuBrul, F. E. Cardullo, Solomon Einstein, E. A. Muller, C. Luhn, A. Pletz and C. Fox. Visits to Cincinnati metal-working plants formed part of the program for those present.

Interactions Between Steel and Slag

Cooperative Program at Pittsburgh Uses Special Furnaces and Crucibles to Determine Best Steel Making Conditions

TO prosecute the five-year research into steel making problems jointly undertaken by the United States Bureau of Mines, Carnegie Institute of Technology, and a group of 29 steel companies (described in THE IRON AGE, Oct. 27, 1927, page 1171), the bureau's electric furnace laboratory was moved from Seattle, Wash., to the Pittsburgh station. It contains a 50-kva. Ajax-Northrup high-frequency furnace, shown in the accompanying view, capable of melting 125 lb. of metal. A 35-kva. furnace of similar design is used for making smaller melts, particularly for making up synthetic slags. Most of the ingots for the studies on deoxidation are made in a 250-lb. Moore 'Lectromelt furnace, and there are other smaller furnaces used for special work.

One of the most troublesome details found during the experimental work is the preparation of crucibles to withstand the various slags at high temperatures. For basic slags, crucibles made of fused magnesia bonded with hydrochloric acid have been most successfully used. Small fused magnesia crucibles with no bonding material have been made by firing in graphite in the small induction furnace. A melt of pure iron, saturated with iron oxide and covered with a pure iron oxide slag, showed only 3 per cent MgO in the slag after holding four hours in such a crucible at 1550 to 1700 deg. C. Silica crucibles are used for acid slags, but it has been found well nigh impossible to prevent erosion of the crucible with acid slags high in iron oxide. Graphite crucibles are used whenever a reducing type of slag is being made and when the carbon content of the metal is not required to be low; graphite is also used in making up some of the synthetic slags.

The practical aspect of such slag studies may be inferred from the common saying among steel-makers that the way to make steel is to make good slags and let the steel take care of itself. A large portion of the research program is therefore centered on the properties of slags: how many impurities a slag will absorb from the steel in a given length of time; how fast does iron oxide, the agent for the removal of carbon, manganese, phosphorus, silicon, and other impurities from the metal, dissolve in the metal from a given type of slag; what changes occur in other physical properties with changes in slag composition. These are some of the questions which are being answered in this Bureau of Mines research work.

The Metallurgical Laboratory at Pittsburgh for Investigating Steel Making Problems Contains Besides the 50-Kva. Electric Furnace Here Shown, Several Other Furnaces, Including One for Studying Deoxidation

Chromium Steel for Railroad Rails

High-Manganese and Bessemer Steel Rails Also Defended by Metallurgists—Low Alloy Gives Prolonged Life Under Heavy Traffic

IN 1913 some heats of acid Bessemer steel containing 1 per cent chromium were made at the Stocksbridge Works (near Sheffield, England) of Samuel Fox & Co., Ltd., rolled into 100-lb. rails, fabricated into eight complete crossings and installed at important junctions on the London, Midland & Scottish Railway. Results were so satisfactory that supplies of the same analysis have been continued, but since 1921 the steel has been made in the acid open-hearth. In describing this material before the May meeting of the British Iron and Steel Institute, Thomas Swinden and P. H. Johnson quote a report by the division engineer for the railroad system as follows:

> "One crossing was laid at the departure end of a station where speed was restricted to 30 miles per hour. The line is in a cut through a deep bed of clay and drainage is difficult. This crossing gave a better life than one of 0.55 per cent carbon Bessemer steel, but the increase was not considered altogether satisfactory.
>
> "Another, laid at the entrance to a very busy station, is exceeding the most sanguine expectations, the life of the high-carbon Bessemer steel crossing being two and one-half years, whereas the chromium crossing has already had a life of 13½ years and is not yet worn out.
>
> "Another crossing at the same station on the departure lines had a life of six and one-quarter years, against two years of the 0.55 per cent carbon steel. This particular crossing was considered the most important on account of heavy traffic, and its life is conclusive evidence of the efficiency of this class of steel.
>
> "A further crossing has had a life of 12¼ years, while the remainder of that particular junction has been replaced a second time during that period.
>
> "A trailing crossing in the main line where trains are passing regularly at a speed of 70 miles per hour is wearing so well that the decrease in depth per annum can be attained only by using the vernier caliper."

In addition to these data on actual wear, Messrs. Swinden and Johnson give the following comparative data:

Chemical Analysis	Bessemer Chromium Steel, Per Cent	Open-Hearth Chromium Steel, Per Cent	Basic Open-Hearth Carbon Steel, Per Cent
Carbon	0.50	0.50	0.55
Manganese	0.85	0.80	0.85
Silicon	0.20	0.23	0.15
Sulphur	0.04	0.03	0.03
Phosphorus	0.05	0.04	0.03
Chromium	1.00	0.95	...
Tensile Properties			
Ultimate strength	133,000 lb.	137,000 lb.	114,000 lb.
Elongation, per cent	9.3 in 3 in.	13.3 in 3 in.	16.7 in 3 in.
Reduction in area	13.9%	38.0%	25.6%
1-ton Falling Weight			
After third 12-ft. drop	3.3 in.	4.0 in.	5.0 in.
Not broken at	90 ft.-tons	72-ft.-tons	...
Brinell hardness	...	270	215

It was found that the chromium steel rails as rolled were capable of being drilled without difficulty and would not air-harden after heating for bending. The ingots rolled well, and were hot-sawn, cold-straightened and milled without difficulty. The extreme toughness under the falling tup (weight 1 gross ton, striking nose 5-in. radius, bearings 4 ft. 3 in. apart) and the high tensile strength indicated that the material was quite suitable for track work, despite the deficient elongation and reduction in area of the early Bessemer heats.

The microstructure of the rail as rolled is a dense mixture of sorbite and very fine pearlite, with a fine broken network of ferrite. The structure at the surface is somewhat finer grained. After a reheating to 950 deg. C. and air-blast cooling, about the only change is that the amount of free ferrite is materially reduced. Such heat treatment increases the hardness only 20 Brinell units, and also materially improves all the tensile properties of the Bessemer steel.

Higher Carbon Reduces Impact Resistance

Carbon should be limited to 0.55 per cent or less, in the opinion of the authors. Such steel is unbroken after successive blows of a 1-ton tup totaling 83 ft.-tons and causing a deflection of 7 in. Raising the carbon to 0.61 per cent gives a harder and stronger rail, but the ductility drops. Such a rail will break on the fifth blow of such a schedule: 7 ft. drop, 20 ft., 20 ft., 12 ft., and 12 ft., a total of 71 ft.-tons.

From such results as the above the authors have concluded that the problem of a more durable rail would be better solved by an increase in alloy content, particularly manganese and chromium, rather than by heat treating a plain carbon rail, or by increasing the carbon content and at the same time limiting the manganese (which is the trend in British specifications).

Discussion of the paper naturally brought in the comparative value of the Sandberg process of heat treating rails. J. H. Whiteley wondered whether chromium steel would develop the "gray spot" sometimes seen after sorbitizing by the Sandberg process. In a broken section, this minute gray spot indicated an internal burst caused by rapid cooling. He felt it was closely allied to the internal fractures frequently found in American high-carbon rails even after normal cooling on the hot bed.

John Millar, engineer of the London & North Eastern Railway, said that road had used switch points and frogs made from steel very similar to that described, except that the chromium was 0.71 per cent. These were installed in very heavy electrified service and the switch points, for instance, gave 2½ years of life as compared to 11 months for ordinary steel. Frogs and crossings lasted twice as long as carbon steel. In all, his company had worn out 250 tons of the chromium steel in special trackwork, and in no case had any flaw or fracture been discovered. Experimenting is now proceeding on a much larger scale; attention has recently been turned toward heat treatment after manufacture.

Manganese in Carbon Steel Could Safely Go to 1 Per Cent

D. Sillars said that, while many railroads insisted on the standard specification (0.55 to 0.65 per cent carbon, not over 0.8 per cent manganese) others did not, and his firm had commonly furnished tonnages of 1 per cent manganese rail and even a little higher. From a practical point, variable air-hardening, because of various rates of cooling on t

hot bed, caused trouble when manganese was above 1.2 or 1.3 per cent. Such rails would have to have special heat treatment. In his opinion, any steel, no matter how well made, would have "gray spots" in the fracture if a bulky portion were sufficiently rapidly cooled, since such occurrences are due to internal stresses. Chromium steels without nickel have a practical fabricating advantage because they are quite machineable, even when fairly high in chromium and having a high tensile strength.

One difficulty in depending upon manganese to give the necessary hardness in rails, in the opinion of the president of the institute, F. W. Harbord, was that this element would ordinarily be adjusted by a ladle addition, and consequently could not be controlled so accurately as the carbon in the bath. In his experience all alloy steels are distinctly sensitive to sudden changes in temperature, and consequently he felt that uniformity in final product could not be easily attained. For instance, a large tonnage of rails containing a fractional percentage of chromium had to be normalized before it would pass the drop test.

One of the authors, P. H. Johnson, in reply, came to the defense of the Bessemer rail. He was in charge of rail inspection and testing for the Midland Railway from 1900 to 1920, and all rails laid during that period were of acid Bessemer steel. Statistics of the Board of Trade for that same period showed that the Midland had the smallest number of breakages of any railroad in Great Britain. Chemical specifications were as follows:

Carbon	From 0.40 to 0.50 per cent
Phosphorus	Not exceeding 0.07 per cent
Sulphur	Not exceeding 0.06 per cent
Manganese	1.10 per cent

The silicon was not mentioned.

A point worth noting is that test pieces from head and foot of these Bessemer rails showed very close to the same tensile properties. Basic open-hearth rails give a much greater variation—a matter he could not explain satisfactorily.

Principles of Steel Mill Lubrication

Friction, Which Absorbs Nearly Half of the Engine or Motor Power, Is Target of Lubricant

BY E. P. MALLISON*

CORRECT lubrication results from the complete and continuous separation of the rubbing surfaces of gears, pinions and bearings by an oil film of sufficient strength to resist the pressures, and with minimum fluid friction. There must be arrangements for a continuous supply, without waste, of clean, cool lubricant of the proper quality.

Increases in the size of ingots rolled, development of the high-speed motor-driven continuous mill and stiff competition in the steel market have increased the value of reliable lubrication, as well as operating economy. Higher costs of modern machinery make both replacement and shutdown exceedingly expensive.

Reliable tests of a reversing mill engine have shown that about 30 per cent of the power is used in deforming the steel, that is, in the actual rolling process. About 27 per cent is used in overcoming idle friction of the engine parts. Another 13 per cent is used in overcoming roll journal friction. About 9 per cent is used in overcoming pinion and spindle friction. The remaining 21 per cent is used in producing acceleration of the parts in reversing. From this analysis, friction absorbs 49 per cent of the total power and only 30 per cent shows up usefully in the product.

Anti-Friction Bearings a Great Help

Development of roller bearings capable of sustaining the great loads involved has materially reduced roll-neck power consumption. Recent tests on modern strip mills, oil lubricated and equipped with latest refinements, indicate a power requirement about half that used in older strip mills of corresponding sizes. On these continuous mills, the power required in overcoming the pinion, gear and spindle friction is 12 to 15 per cent of the total power.

Primarily, lubrication in a modern mill is applied by means of a circulating oiling system. The system includes a main supply line with branches to the various elements to be lubricated, a common return line to take the individual returns from each element, a suitable tank for receiving and cooling the return oil and separating from it the water and heavy impurities, a means of cleaning and purifying the oil and storage capacity for clean oil.

Oil is applied to the gears under a pressure of 20 to 30 lb. to the square inch, by properly designed spray nozzles. The nozzles deliver the oil close to the pitch line, so that at the moment of contact the gear teeth are generously lubricated. Oil to the pinions is supplied at the top of the housing and cascaded into the engaging teeth by suitably arranged baffle plates.

Choice and Care of Lubricants

Selecting the proper lubricant is an important matter. It must possess enough body to establish on the working surfaces a film of sufficient strength to resist rupture from the pressures imposed. These pressures are most severe on the engaging teeth of pinions, because of the shock loads involved. The lubricant must be adaptable for use in a circulation system, involving the constant reuse of the same quantity of oil.

Natural enemies of lubrication are heat, air, water and solid impurities. Air and heat cause a certain amount of oxidation of the oil, forming some products that are soluble and others that are insoluble. Water combines with products of oil oxidation and other foreign impurities to form emulsions. The activity of these agents is overcome by using an oil of maximum chemical stability, by removing water and solids from it, and by reducing the soluble oxides. Cooling, cleaning and settling the oil further this corrective action.

*Vacuum Oil Co., New York. Abstract of a paper presented before the Philadelphia district section of the Association of Iron and Steel Electrical Engineers.

An addition of 1,300,000 kw. to the electricity supply of the four States of Illinois, Wisconsin, Indiana and Michigan in the three years ended Dec. 31, 1927, is noted in a report of the power survey committee of the Great Lakes Division of the National Electric Light Association. This gives these four States a total energy supply of 4,556,000 kw. About 10 per cent comes from hydro-electric stations, and the remainder is steam-generated. The four States have nearly 17.5 per cent of the total supply of electrical energy in the United States.

New 32-In. Stroke Draw-Cut Shaper

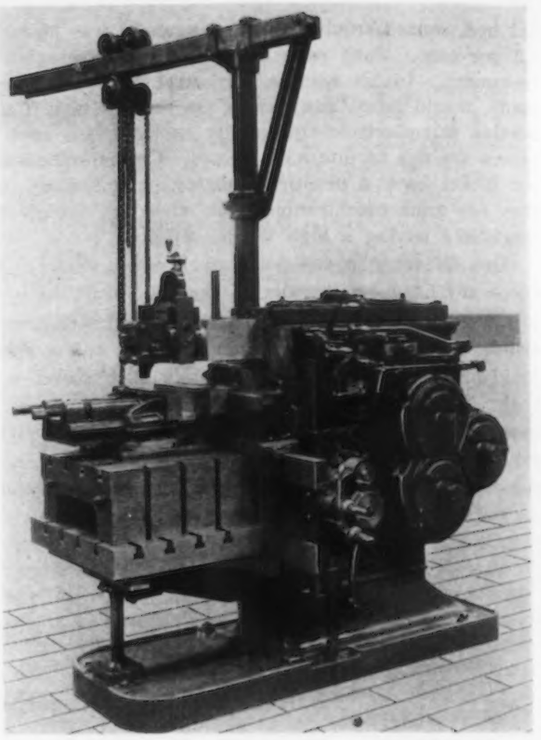
A 32-IN. high-duty draw-cut shaper, similar in design to its larger draw-cut machines, but incorporating a number of improvements, has been added to the line of the Morton Mfg. Co., Muskegon Heights, Mich.

The lower table and outer support is of new design. It is of angle bracket type and is considerably lower than the saddle, giving clearance of 31½ in. between the ram and lower table, which permits the finishing of large and bulky castings. The lower table has at its outer end an automatically adjusted outer support which is secured directly to the cross-rail of the machine. It is raised and lowered by screws of large diameter operating in independently adjustable nuts bolted to the extension base. Two vertical feed screws are used. The horizontal feed of the table is 32 in. and the vertical feed 16 in.

The ram, of high-carbon steel, is 6 x 6½ in. and has bearing surface on four sides. The clutches, reversing mechanism for operating the clutches and the stroke adjustment are the same as on the company's other draw-cut shapers. The feed is of automatic relieving type with large friction surfaces.

The machine is provided with power rapid traverse. Splash lubrication is employed for clutches and journals subject to heavy cutting strain. The adjustable back bearing forms a stop against which work may be placed, this bearing being said to transfer the thrust of the cut directly against the column of the machine.

Equipment includes crane with ½-ton hoist of two-speed type, a steel head, a swivel vise with 14-in. opening, and a 28 x 32-in. T-slotted top plate. The machine will accommodate shell planing, shoe and wedge and rod brass attachments for railroad work. It can be furnished either for belt or motor drive.

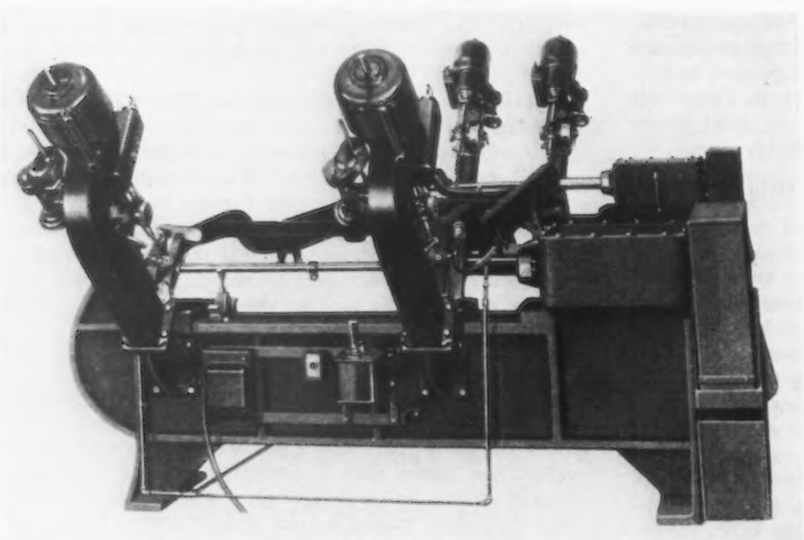


The Lower Table and Outer Support Are of New Design. It provides clearance of 31½ in. between the ram and lower table for bulky work

Chassis Frame Assembly Press

THE chassis frame assembly press illustrated is offered by the Hanna Engineering Works, 1765 Elston Avenue, Chicago, as an important adjunct to a chassis frame riveting installation when one or more tubular cross members must be pressed into the horns or outriggers which have been previously riveted to the side bar channel webs.

The press rams open wide to permit quick loading of the frame parts. The rams act in unison, advancing rapidly until they engage the side bar channel, when the speed is reduced automatically and stopping automatically, when the side bar channels are properly spaced. Standard drill heads with automatic feed engagement, reverse and quick return, are used for drilling the holes for the rivets which dowel the tubular cross members in place. The machine is self-contained, with motor drive, limit switch controls, drilling coolant pump and sump, and pump for lubricating the moving parts.



The Press Rams Open Wide to Permit Loading of the Frame Parts. They advance rapidly to the work and stop automatically when the side bar channels are spaced properly

Simplified Practice in Many Items

Simplified practice recommendations have been issued by the United States Bureau of Standards for steel barrels and drums, die-head chasers, metal lath, roofing ternes and steel lockers. Copies of these recommendations may be obtained at 5c. each from the Superintendent of Documents, Government Printing Office, Washington.

Each of the papers gives the history of the project with which it is concerned, and gives in tabular form the accepted standards that have been adopted by the various committees and have been accepted by 80 per cent or more, in each case, of the productive capacity of the country.

Gear Hobbing Machines for Helical, Herringbone, Spur and Other Gears

THE Newark Gear Cutting Machine Co., 69 Prospect Street, Newark, N. J., has added a new hobbing machine to its "Spirit of Production" line of gear cutting machinery. The machine is built in both plain and universal types and has capacity for hobbing gears up to 18 in. in diameter under the overarm that ties together the vertical stanchions. Without the overarm gears 24 in. in diameter can be cut.

The universal machine is intended primarily for helical, herringbone and spur gears and worm wheels. A distinguishing feature is an improved differential mechanism for hobbing helical and herringbone gears, which mechanism permits separate and easy control of the lead, feed and indexing trains of gearing, so that for a given helical angle and pitch only the number of teeth need be considered when changing over the machine. Any desired feed may be obtained and changed at any time without losing the helical path and without recalculating gear train ratios. The plain type machine, which is primarily for spur gears, spline shafts and worm wheels, does not require the differential mechanism, although it can be furnished as an extra.

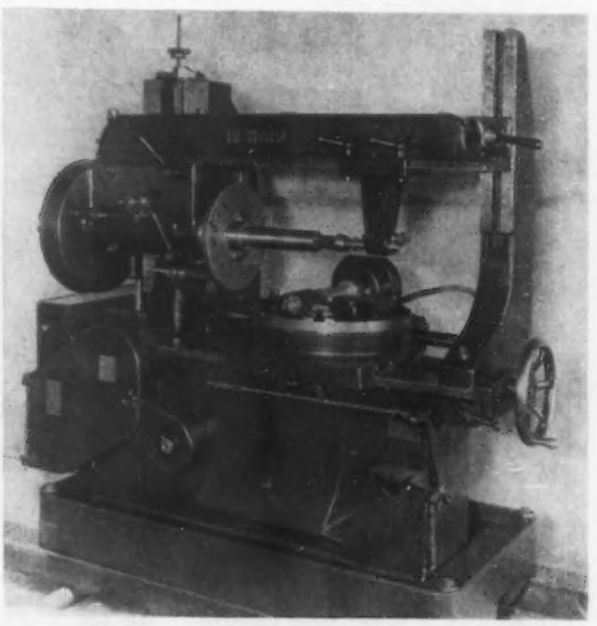
Frame, stanchion, work-spindle and its housing, and the feed parts are the same in both types of machine. With the horizontal cutting principle long shafts and gears that are integral with their shafts may be handled conveniently. The work-spindle is bored 2½ in. for this purpose.

The cutter drive is arranged so that the cutter spindle is brought very close to the frame ways, which gives increased rigidity. Power is received from a splined side-shaft through a hardened and thread-ground worm mounted in Timken bearings, and is transmitted to a combined worm-wheel and bevel gear ring and then to a bevel gear ring mounted directly on the hob spindle. It is pointed out that three rotating gear members thus perform the function of two distinct pairs of gears. The ring gear also acts as a flywheel to steady the cutting action, and it is completely guarded and out of the way. A hole in the center of the ring gear conveys the cutting compound and chips to a chip box in the frame of the machine. Provision is made for rapid traverse of the cutter carriage in both directions whether or not the hob is revolving.

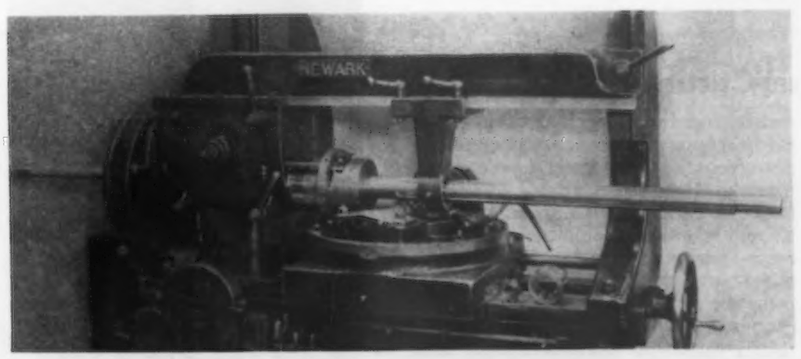
Automatic lubrication is provided for the gear box mechanism. Speed change gears are driven by square shafts, and lead, feed and indexing gears by double-key shafts, the keys being integral with the shafts. The master worm wheel is generated in place on its own bearings and the master worm is mounted in tapered roller bearings.

Extra equipment for special work can be furnished. The illustration shows a tangential attachment for generating worm wheels, with taper hobs, or star cutters or with fly tools when hobs are not available. The attachment functions rapidly and smoothly and may be applied to the machine conveniently by first removing the outer cap bearing of the cutter spindle. The rapid traverse motion and differential mechanism function with this attachment. An attachment for automatically hobbing long multiple spline shafts can also be furnished, this attachment illustrated herewith. The regular cutter carriage is clamped to the frame ways when this attachment is in use, and the regular feed mechanism is disengaged. Shafts being splined are fed through the work spindle automatically.

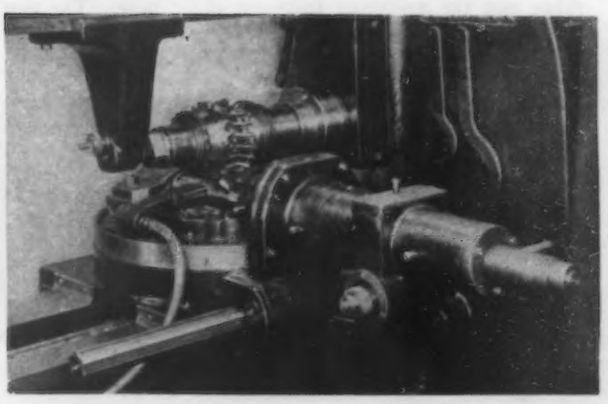
The machine uses hobs up to 4½ in. in diameter and 5 in. long, and has capacity for cutting teeth of 4 diametral pitch in steel at a fast rate.



An Improved Differential Mechanism Is a Feature of the Universal Type Hobbing Machine. The cutter spindle is located close to the frame ways to give increased rigidity



Long Multiple Spline Shafts May Be Hobbed Automatically on the Attachment Shown Above. The tangential attachment, at the right, is for generating worm wheels with taper hobs or star cutters and fly tools

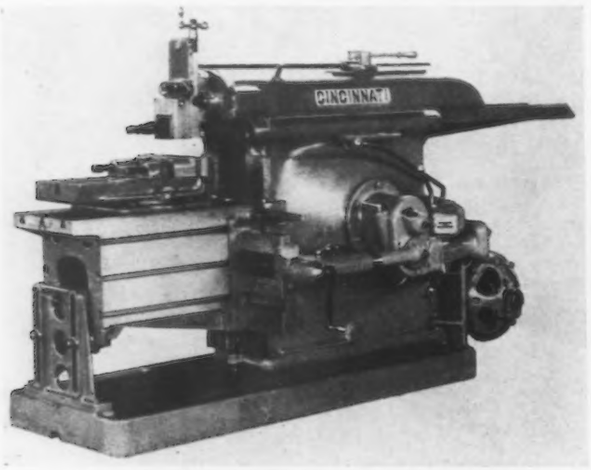


and occasionally teeth of 3 d. p. Teeth of 3 d. p. can be cut in cast iron. Hob speeds range from 38 to 145 r.p.m. and feeds from 0.015 to 0.250 in. per revolution of the work. A 5-hp. motor is used. The net weight of the machine is approximately 6000 lb.

New 36-In. Rapid-Traverse Shaper

A NEW 36-in. rapid-traverse shaper designed to combine the speed and convenience of a small machine with the strength and power of a large shaper has been brought out by the Cincinnati Shaper Co., Cincinnati. The machine has a ram 6 ft. 4 in. long, with a bearing in the column of 3 ft. 10 in. It occupies floor space of 5 ft. 2 in. by 12 ft. 1 in. The strokes per minute range from 8 to 102 and the cross feeds, 11 in number, range from 0.010 to 0.170 in.

In addition to power rapid traverse to the table, features include convenient speed and cross-feed changes, automatic oiling, centralized control, improved "spring throwout" hand feed and quick-control indicators, which tell at a glance the feed, speed and length of stroke being used. A full length taper gib with single screw adjustment is provided. One wrench is used for all adjustments.



Power Rapid Traverse to the Table Is Provided. Lubrication is automatic

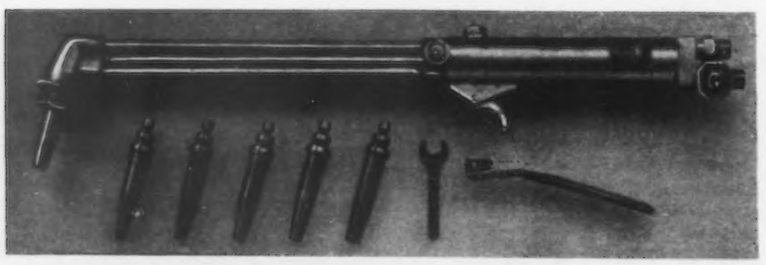
The shaper is furnished either with single pulley belt drive or arranged for motor drive.

A universal table with a rocking top is available for use on the machine.

New General-Purpose Cutting Torch

THE Air Reduction Sales Co., 342 Madison Avenue, New York, is placing on the market a new general-purpose cutting torch with improved high-pressure valve, interchangeable trigger or lever control and replaceable valve seat. The torch is fitted with the new standard hose connections and is furnished with either 75 or 90-deg. angle head. The weight with tip is 3½ lb. and length, over all, 21 in.

The high and low-pressure oxygen tubes and the acetylene tube are of seamless brass, and are silver-soldered to the head and rear end. The valve controlling the oxygen cutting jet is made accessible for examination or replacement by removing a screw cap directly above the trigger. The torch uses the range of tips from No. 1 to No. 8. Interchangeable tips for acetylene, hydrogen, city gas or other fuel gases, and choice of medium or low-pressure acetylene tips are available. Standard oxygen hose connection is for ¼-in., inside diameter, hose, and acetylene hose connection for 5/16-in. hose. The new cutting torch is furnished singly or as part of a complete outfit.



Oxygen and Acetylene Tubes of Seamless Brass, Silver Soldered to the Head and Rear End, Are Used

Non-Corrosive Sleeve for Pipe Ends

IT has been noticed that corrosive action in pipe lines is usually most severe at the ends, where threading operations have left the least metal to withstand it. This is thought to be the result possibly of eddy currents set up at joints. The two pipe lengths joined end to end seldom or never butt closely together; it results that the short space of increased diameter at the sleeve coupling acts as an expansion chamber, setting up a scouring agitation which also enhances corrosive action.

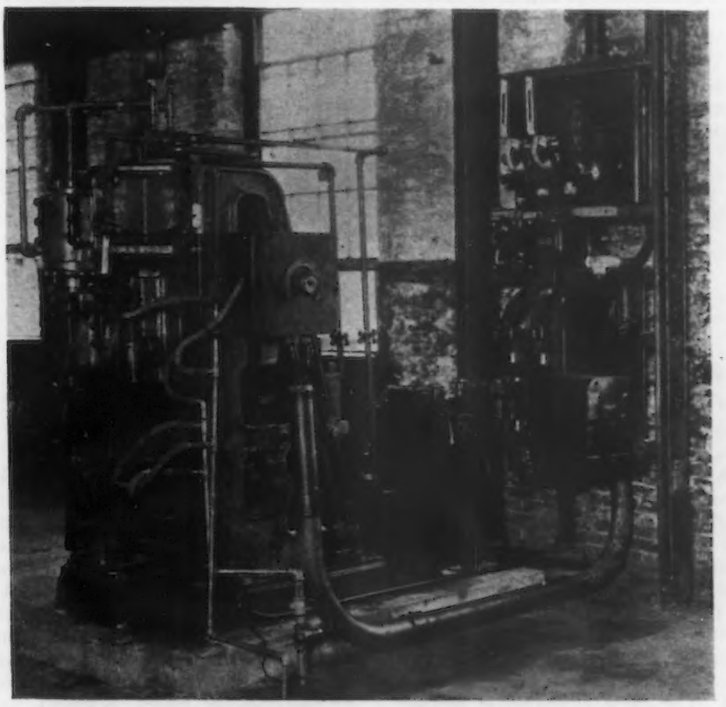
To avoid the waste of leaks at such joints, and the expensive replacement of leaky pipe lines, the Pipe-Saver Corporation of America, Carthage, N. Y., has placed on the market the "pipe-saver" illustrated. It consists of a sleeve of non-corrosive alloy to be driven into the reamed end of a threaded pipe. It has a slight lip at its end, flanged outward the thickness of the pipe wall. This holds the pipe-saver in place and also threads into the coupling. The device also has a taper calculated to assure tight fit, notwithstanding any slight variation in internal diameter of the pipe.

Pipe Saver Is a Tapered Sleeve Driven into Threaded End to Protect Against Internal Corrosion

Massive Spot Welder

SPOT-WELDING of structural members or plates up to ½ or ⅝ in. thick may be done on Model 40-AV, designed by Thomson Electric Welding Co., Lynn, Mass. It is a rugged machine, designed for heavy clamping pressures and large transturn is of such a size that the clamping pressure is 14,000 lb. Hose connections are for cooling water to the welding dies.

Control is simple. Current control for different thicknesses of material is obtained through a five-point regulator switch mounted at the side of the welder and connected with tapped primary coils of the transformer. Operation of the welding circuit is controlled through a pushbutton switch mounted on the pressure control lever at front of the machine—this switch being connected with a magnetic contactor. A four-way manually controlled hydraulic valve for controlling the hydraulic system supply is mounted on top of the welder.



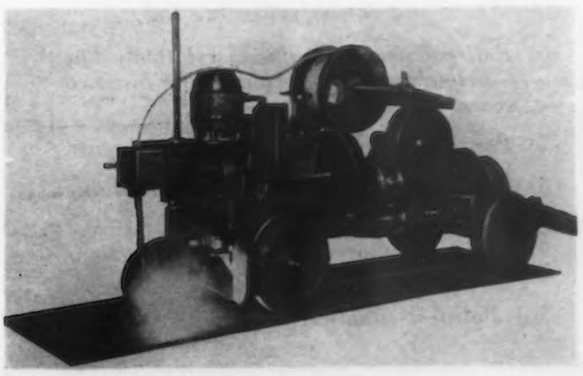
Pushbutton Control for the Welding Circuit Makes for Ease in Operating

former capacity (250 kva.). The lower horn may be fixed in any one of three positions, giving a maximum opening of 10½ in. The upper terminal is attached to the piston rod from a hydraulic cylinder and has a 3-in. stroke. As shown by the illustration, a 7½-hp. motor-driven oilgear pump is mounted on the same foundation to the rear, capable of delivering a pressure of 1000 lb. per sq. in. to the upper cylinder, which in

Tractor-Type Arc Welder for Lap and Butt Welds

AN automatic tractor-type arc welder utilizing the "electronic tornado" principle, outlined in THE IRON AGE of June 28, page 1810, and used for making lap and butt welds on large tank bottoms and roofs, large pipe and on similar work, has been made available by the Lincoln Electric Co., Cleveland. High welding speeds, from 50 to 75 ft. per hr. on ¼-in. lap joints and smooth and uniform welds are important claims.

The machine, illustrated herewith, consists of an electronic tornado head mounted on a self-propelled four-wheel-drive carriage. Power is supplied through a flexible cable and in using the machine it is only necessary to position it over the seam to be welded and to start the arc; the electrode and fibrous autogenizer are fed automatically as the tractor travels forward. In making lap welds additional filler metal is not required. It is stated that the heat of the carbon arc fuses the edge of the top plate to the lower plate, making a leak-proof joint. In making butt welds a filler strip is laid over the seam to be welded.



High Speeds and Uniform Welding of Tank Bottoms, Large Pipe and Other Work Are Claimed

Management Meeting at Chicago, Nov. 13-15

The American Management Association, New York, will hold its autumn convention at the Palmer House, Chicago, Nov. 13 to 15. Preliminary plans call for a paper on the research activities of various companies by Dr. Z. C. Dickinson, professor of economics, University of Michigan, followed by discussions of the various types of research. One session of the meeting will be given over to the subject of compensation of executives and another to budgeting. Bryce Stewart, Industrial Relations Counselors, Inc., will speak on "The Financial Aspects of Pension Plans," and C. R. Dooley, manager personnel and training, Standard Oil Co. of New Jersey, on "Employment and Adjustment of Older Workers." The report of a committee on trends in industrial health practice will be presented by J. Walter Dietz, superintendent of industrial relations at the Kearny, N. J., plant of the Western Electric Co., Inc.

The third technical meeting of the Institute of Management will be held at the same place on Nov. 12 and the semi-annual conference of the association's office executive group on Nov. 16. W. J. Donald, 20 Vesey Street, New York, is managing director of the association.

Receivers Appointed for Eagan-Johnson Company

Upon application of the Bethlehem Steel Co., in friendly action, the United States District Court has appointed Daniel C. Eagan and the Pennsylvania Title & Trust Co., Chester, Pa., to act as co-receivers in equity and administer the affairs of the Eagan-Johnson Steel & Iron Co., Crum Lynne, Pa. Permission for the receivers to operate the company's plant has been granted by the court and interests identified with the company are actively developing plans for reorganization.

Business Analysis and Forecast

Large Business Volume to Be Expected

Movement of P-V Line Indicates Stable Conditions—Automobile Industry Holds the Key to Demand

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IN spite of pronounced activity, amounting to a boom, in the automobile business, and improvement in the copper and petroleum industry, business conditions continue very mixed, with no pronounced general upward trend. There has been a fair seasonal expansion and the average of industrial activity is about 8 per cent above normal, but the underlying general trend is only about sidewise. This conforms to the forecasts made by the P-V line in recent months, during which time this barometer has held about horizontal.

The most important favorable factor is the large buying power shown by the average person, which is reflected in the high rate of automobile production and the good volume of retail sales. The general stability of commodity prices is also to be mentioned. The most important unfavorable factors are found in the money situation and in building activity. Excessive speculation on the stock exchange is also an unfavorable condition. The farm situation is neither very good nor very bad, as reduced prices of the chief cash crops are tending to offset increased yields. The whole situation is dangerously dependent on continued large volume in the automobile industry.

As to the future, it now seems reasonably certain that no large recession in business is possible this year. There is no great maladjustment in business, outside of finance, and even the financial situation pertains more to the stock market than to business. A severe liquidation in stocks would unquestionably affect business unfavorably for a time, but not deeply. In some respects business would be

Factors in the General Business Outlook

Favorable Factors

(1) *The automobile business continues extraordinarily active.*
(2) *Retail trade is in good volume.*
(3) *Increased activity and earnings appear in the copper industry; the oil business shows improvement.*
(4) *No important general maladjustments in industry now apparent.*
(5) *Commodity price average firm and quite stable; scrap, pig iron and copper are higher.*
(6) *Machine tool orders resumed rising trend in August.*
(7) *Farm situation moderately good.*
(8) *Most leading companies in strong financial position and have good earnings.*
(9) *Mercantile inventories are light.*

Unfavorable Factors

(1) *Sharp declines in building contracts and permits indicate approach of a downward movement.*
(2) *Money is increasingly tight, with time money at 7¼ to 7½ per cent, the highest in seven years; net demand deposits decline, while brokers' loans and commercial loans increase; member bank borrowings large.*
(3) *Wild speculation continues on stock exchange, with no regard to fundamentals.*
(4) *Some indications point to intrusion of speculative spirit in business (automobiles, copper, chain stores.)*
(5) *Wheat and cotton prices are low.*
(6) *Railroad freight traffic is relatively low—below the same period of the last two years.*
(7) *Post office receipts declined in August.*
(8) *August exports indicated a declining trend.*
(9) *Business failures numerous; collections mostly poor.*
(10) *Political situation uncertain.*

benefited. No reliable statistical barometers forecast a decline in general business.

But it seems equally certain that no large expansion is in sight. Too many unfavorable factors exist and conditions are too mixed to suggest much of an upward movement. It is difficult to see how a general advance can occur, with building activity on the decline and the investment market dulled by high money rates.

We conclude, therefore, that a practically stable level of business is in prospect. A relatively small seasonal expansion is likely to be shown by the September and October figures, and probably seasonal declines in basic industries will be considerable in November and December. Money rates will continue high. Building activity will recede.

Large Business Volume Predicted

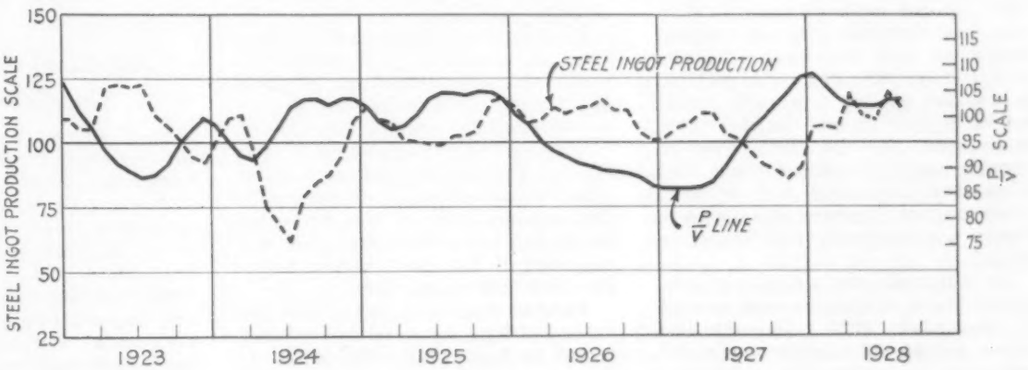
OUR chief barometer of general business, the P-V line, continues above normal and pursues a general sidewise trend. It rose slightly in July and August, though not sufficiently to indicate any considerable improvement in business conditions. The small upturn was due chiefly to a little rise in the level of commodity prices, while the physical volume of trade remained about the same. These conditions, we infer, indicate some improvement in the demand for commodities, in purchasing power or desire to buy, or both. This barometer forecasts a fairly stable and large volume of business during the remainder of the year, with fair to good earnings for the average company.

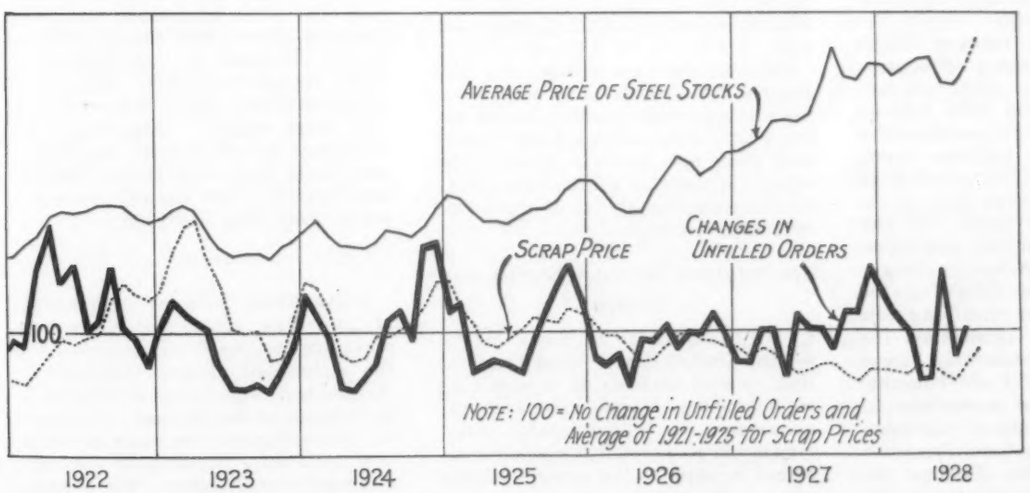
Our adjusted index of steel production continues right in line with the barometer, and the slight gain in the latter tends to support the opinion that steel-making activities will at least show seasonal gains. No recession is yet indicated.

Exceptionally Heavy Automobile Output

THE second chart shows that the automobile boom continues, while new building contracts are on the decline. Final official figures show a

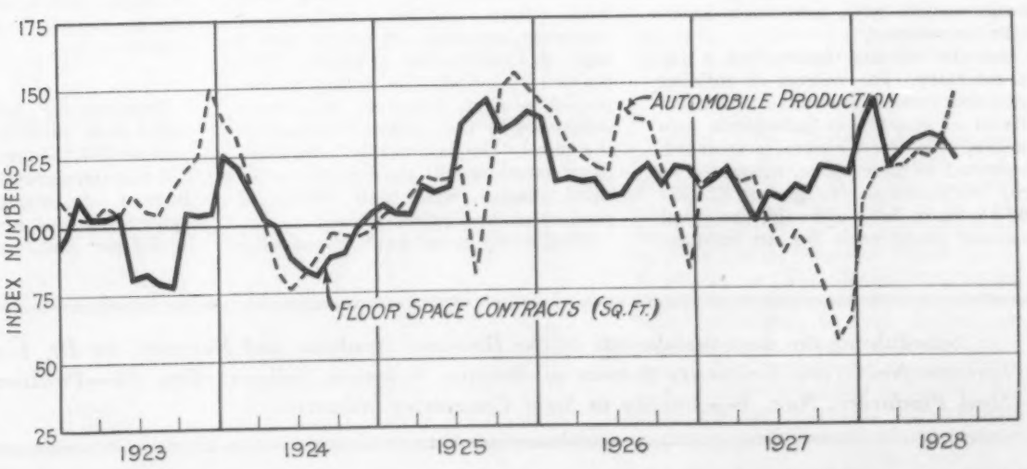
Sidewise Movement of P-V Line (Ratio of Commodity Prices to Physical Volume of Trade) Indicates Stable Business Conditions and Large Volume. Steel production (adjusted) continues high





Unfilled Orders Are Moving Narrowly About the Axis; Stock Prices, Though at a Much Higher Level, Are Irregular and Scrap Prices Are Considerably Better

Both Building Activity and Automobile Output Showed Continued Strength in August, Though the Former Dropped Considerably. Tapering off is to be expected



total of 489,800 passenger cars and trucks produced in the United States and Canada in August. The previous high was 474,500, in July, 1926. The August production compares with 416,400 the month before. It may truly be said that the automobile business has reached boom proportions. Never in the history of the country has there been such a volume of buying of new cars, chiefly in the lower priced groups. The production of Chevrolets has been enormous, and Ford output is steadily growing. It is now easily possible that automobile production in 1928 will exceed that of 1926.

When we allow for seasonal conditions, the gain is the more notable. Our adjusted curve of automobile output, shown in the chart, rises sharply to the highest point since December, 1925. On the adjusted basis, production was exceeded only in October, November and December of 1925, though July, 1926, was nearly as high. A seasonal decline is usually apparent in September and becomes more pronounced in the last quarter. Though current reports indicate that September production will be little below August, it seems reasonable to expect a considerable letdown thereafter.

As adjusted, the automobile production curve is near the peak reached in November, 1925. The question arises, are we not again near a peak? And just as automobile production slumped after November, 1926, will it not now fall off before long? We know of no way to forecast definitely, but an early peak and a subsequent decline seem probable. (1) Past performance in 1923 and 1925 indicate such results. (2) The automobile curve usually follows the building curve, and the latter has already turned down. (3) There is some limit to the number of cars that people can buy in any given short period, and movements like the present usually come in waves, with troughs following the crests. Allowing for the long-time trend of automobile production, the present rate is considerably above normal and a period of above-normal production cannot last indefinitely.

Apparently the people of this country are plunging on automobiles much as they are on stocks. Perhaps the paper profits they are piling up in the stock market have something to do with the matter.

But the building figures tell a different story. The volume of building contracts turned downward in August almost as sharply as automobile production rose. New contracts awarded, measured in floor space, amounted to only 78,873,000 sq. ft., against 82,125,000 sq. ft. in July, although the usual seasonal trend calls for an increase of over 2 per cent. Our adjusted index, based on the average for 1921-1927 as 100, was 121.1, which compares with 129.5 in July and 130.6 in June. This represents the lowest annual rate since March. Coming just at the time when the effect of higher money rates should begin to be perceptible, the decline may be taken as marking the end of the upward trend in the building cycle, which began in June, 1927.

Moreover, the contemplated new construction as reported by the F. W. Dodge Corporation fell sharply in August to the lowest point since October, 1927. Our adjusted index for the month is only 111 per cent of the average for 1921-1925, in comparison with 122 per cent in July and 127 per cent a year ago. The figure is relatively low as compared with contracts actually awarded.

Finally, the building permits, covering the construction of residences, stores and office buildings in cities and towns, are estimated for August at $275,000,000, against $281,000,000 in July and over $302,000,000 a year ago. In this case the adjusted index, allowing for seasonal conditions, is 110, against 118 in the preceding month and 140 in February, which was the peak of the year. (The average for 1921-1925 equals 100.)

Another significant fact is that the volume of long-term real estate bonds issued in August fell off sharply. In that month they amounted to only $21,947,000, in comparison with $48,495,000 in July and $32,247,000 a year ago.

Of course, a large volume of actual construction is under way at present, for the contracts awarded during the last few months are now being carried out. In a few months, however, the actual construction will feel the effects of the reduction of new permits and contracts awarded.

Speculation in Steel Stocks and Scrap

STEEL stocks as a group, led by the United States Steel Corporation, pushed through to a new high in September. Some considered the movement in United States Steel common as a speculative maneuver designed to support the general market when it showed signs of going stale, while others regarded it as based on improved earnings prospects and a sign of fundamental strength. That purely speculative considerations played a part, however, is perhaps suggested by the belated character of the move. Unquestionably steel company earnings will show gains in the third quarter, with both volume of production and prices higher.

Steel scrap prices have moved quite similarly to the average price of the steel stocks, and in September averaged higher than in any month since early 1927.

Unfilled orders of the Steel Corporation, however, showed little more than a merely seasonal gain in August, and the rate-of-change line in the chart is thus only about level with the base line, though this is an improvement over the preceding month.

We are unable to draw many inferences from these facts. Evidently speculation is active both in steel stocks and in steel scrap, while forward buying of steel is but moderate. Probably the fact that the very similar situation last September marked a peak in scrap and steel stock prices has some significance.

Output of Steel Barrels Continues High

Steel barrels produced in August are reported by the Department of Commerce at 677,313, representing 57.8 per cent of capacity of the 27 companies reporting. This is a gain of nearly 5 per cent from the 647,844 units made in July and, with the exception of May and June of this year, represents the largest monthly output ever made. It compares with 615,152 units in August, 1927.

For the first eight months of the year, the 1928 production has been 5,033,749 barrels, the largest ever recorded. It represents an increase of about 10 per cent from last year's 4,585,126 units, which was the previous high record. Shipments have held close to production, the difference in the first eight months, having been less than 5000 barrels in an output of more than 5,000,000.

Construction costs are higher than at any time since last December, according to statistics compiled by the Associated General Contractors of America. The rise is attributed to an increase in the average prices paid by contractors for the basic construction materials, particularly concrete aggregates and lumber. The average of wages paid in the construction industry remained unchanged during August.

Immigration for the fiscal year ended June 30, 1928, was 500,631, comprising 307,255 immigrants and 193,376 non-immigrants, according to the Bureau of Immigration. The 1928 figures reflected a decrease of 37,370, or 6.9 per cent, compared with 1927.

Schedule of the next instalments of the ***Business Analysis and Forecast,*** *by Dr. Lewis H. Haney, Director New York University Bureau of Business Research, follows:* ***Oct. 18—****Position of Iron and Steel Producers;* ***Nov. 1—****Activity in Steel Consuming Industries.*

Steel Corporation May Resume Ojibway Construction

TORONTO, ONT., Oct. 2.—The Essex County Council has agreed to a fixed assessment for the Canadian Steel Corporation, Ojibway, Ont., a subsidiary of the United States Steel Corporation. The assessment is to run for 10 years on the industrial property of the company. If the Ontario Legislature passes special legislation to legalize the agreement, the company is expected to proceed with the establishment of steel works at Ojibway.

Under the proposed agreement, assessment upon the industrial area is fixed at $900,000 from 1929 to 1931, inclusive, conditional upon 500 bona fide employees being engaged at the works by the end of 1931. The assessment for the following three years is to be $1,100,000, with the further condition that 800 men are engaged at the end of that period; and in 1934 the assessment goes to $1,300,000 for the next three years.

The Canadian Steel Corporation has owned a large tract at Ojibway for more than 15 years. Several millions of dollars have already been invested in the plant and a blast furnace is partly erected, but so far no operations have been carried on there. There is also on the site a wire mill which is not yet ready for operation, though considerable equipment has been removed from Hamilton, Ont., to Ojibway.

Recent developments and arrangements with regard to assessment, etc., are taken to indicate that the steel company is preparing to finish at least a part of the proposed plant and start operations. Ward B. Perley is president of the Canadian Steel Corporation.

Increase in Imports of Pig Iron

Imports of pig iron in August are reported by the Department of Commerce at 12,990 tons. This is the largest total since April and is more than double the July movement of 6055 tons. More than half the imports came from British India, with the bulk of the remainder from the United Kingdom and the Netherlands.

Compared with last year, the imports of the first eight months show a gain of nearly 12 per cent. Shipments coming in from United Kingdom have been two and a half times as great as last year, while those from Germany have almost disappeared. Details of the month, with comparisons, appear in the table.

Iron and Steel Institute Announces Program

At the thirty-fourth general meeting of the American Iron and Steel Institute, to be held at Hotel Commodore, New York, Oct. 26, the following technical program has been provided:

"An Acoustic Laboratory for the Testing of Music and Other Steel Wires," by W. B. White, acoustic engineer American Steel & Wire Co., Chicago.

"Uniformity, Continuity and Magnetic Testing," by A. V. deForest, research engineer American Chain Co., Bridgeport, Conn.

"Steel Requirements of the Aircraft Industry," by H. J. French, senior metallurgist Bureau of Standards, Washington.

"Recent Observations of Some European Iron and Steel Conditions," by C. A. Meissner, United States Steel Corporation, New York.

"The Present Status of Structural Steel Welding," by F. T. Llewellyn, president American Welding Society, New York.

"Steels Used by the Automotive Industry," by W. J. MacKenzie, vice-president Interstate Iron & Steel Co., Chicago.

The usual banquet will be held in the evening.

Pittsburgh Mill Ships by Water to Northwest

Included in a tow of nine barge loads of steel products of the Jones & Laughlin Steel Corporation, which left Pittsburgh Sept. 30, was one barge load of wire products, which will be turned over to the Federal Barge Line at Cairo, Ill., for delivery to Minneapolis, which is one of the ports of the upper Mississippi Barge Line at present being operated by the Federal Government. This marks the first all-water shipment of steel from Pittsburgh to the Northwest. It also marks another step by Pittsburgh mills in the efforts to expand their markets which had been limited by high railroad freight rates.

Steel Mail Cars Demanded in Proposed Bill

WASHINGTON, Oct. 2.—Representative M. Clyde Kelly of Pittsburgh has announced that he will reintroduce at the next session of Congress a bill which provides that after Jan. 1, 1930, all cars or parts of cars used for the railroad postoffice service shall be of steel construction, the style, etc., to be determined by the Postmaster-General. Railroad interests have opposed the bill which they claim, if enacted into law, would cost them ultimately $60,000,000 together with the scrapping of $30,000,000 of present equipment. They contend that the legislation is unnecessary because the railroads are already making headway for equipping their trains with safe mail cars. A companion bill to the Kelly measure was introduced in the Senate by Senator Dale of Vermont but was amended before being passed by that body. The latter bill was so amended that it would not apply to trains operated upon branch lines, independent short line railroads, narrow gage or electric railroads.

Russian Company in Berlin Handles Manganese Ore

HAMBURG, GERMANY, Sept. 15.—It is understood that the Manganerz Export Co., Berlin, has been established to handle exports of Russian manganese ores from the Caucasus. The company is owned by the Russian Government and, it is understood, replaces the organization formed by the Harriman interests, which recently relinquished their concessions in Georgia. The German firm of Rawack & Grünfeld, Berlin, controls exports of manganese ore from the Russian Nikopol mines, so that the entire exports of the Caucasus are now centralized in Berlin.

Germans Experiment with Sponge Iron Process

HAMBURG, GERMANY, Sept. 15.—The Eisenschwanngesellschaft G. m. b. H. has been established through a combination of the interests of the Vereinigte Stahlwerke A. G. and Friedrich Krupp A. G., for the purpose of producing sponge iron by the direct reduction process under the Swedish Norsk-Staal patents. It is understood that a plant with a capacity of 20,000 tons a year is planned for experimental purposes. If the process proves satisfactory, it will be introduced into a few departments of the Krupp and Vereinigte Stahlwerke plants.

UNITED STATES IMPORTS OF PIG IRON BY COUNTRIES OF SHIPMENT

	August		Eight Months Ended August	
	1928	1927	1928	1927
United Kingdom	2,550	.....	37,327	14,935
British India	7,495	9,703	34,269	37,900
Germany	.....	560	95	8,371
Netherlands	1,833	2,422	17,673	19,468
Canada	.....	.....	378	689
France	.....	1,000	300	1,500
Belgium	.....	399	202	699
Norway	321	.....	412	.....
All others	791	.....	3,684	1,218
	12,990	14,084	94,340	84,780

All products formerly sold by the Waterbury Mfg. Co. and the U. T. Hungerford Brass & Copper Co. are now sold under the Chase name and mark, according to an announcement by F. S. Chase, president Chase Brass & Copper Co., Inc., Waterbury, Conn. Chase Brass & Copper Co. warehouses were established in 1921 in various cities and last year the Chase Companies, Inc., bought the assets of the U. T. Hungerford Brass & Copper Co., which also had brass and copper warehouses in a number of cities.

Hearings on Youngstown to Ohio River Railroad

WASHINGTON, Oct. 2.—Arguments were made on Thursday of last week before the Interstate Commerce Commission on the application of the Pittsburgh, Lisbon & Western Railroad for authority to construct two branch lines to connect the Youngstown district with the Ohio River.

Attorneys for the applicant contended that the new lines would move substantial tonnages which are not now moving, having reference to shipments of coal from western Pennsylvania to the Youngstown district and of steel from that district to Southern and Southwestern markets.

Attorneys for the railroads contested the claim, arguing that the only effect of the new lines would be to deprive the trunk carriers serving the Youngstown district of some of the tonnage they now carry. They also attacked the relationship between the Pittsburgh Coal Co. and the Pittsburgh, Lisbon & Western and Montour railroads, which the coal company owns. It was insisted by them that the fact that the Pittsburgh Coal Co. owns terminal facilities at Smith's Ferry, Pa., where one of the new branches would begin, raised a serious question as to whether there would be discrimination against other shippers. Attorneys for the applicant replied that instead of shippers being discriminated against they would likely get reduced prices on coal through the rail and river route and that the new line would benefit the public.

The report of the examiner who conducted the hearings in the case was favorable to the new construction.

Increased Imports of Iron Ore

August iron ore imports are reported by the Department of Commerce at 225,538 gross tons, compared with 183,256 tons in July and 188,892 tons in June. The August incoming movement was the greatest since February. It represented, however, a shrinkage of more than 25 per cent compared with August, 1927, when 303,586 tons came in.

Imports in the first eight months reached 1,677,206 tons, a reduction of about 11 per cent from last year's 1,879,180 tons to the same date. This reduction has been mainly at the expense of Sweden, where the mine strike resulted in cutting off almost 90 per cent of what came in during the preceding year. There was an increase of 55,000 tons in imports from Chile, which have amounted this year to considerably more than half the total. Details of the month, compared with the preceding year and the eight months of the two years, are shown in the table.

SOURCES OF AMERICAN IMPORTS OF IRON ORE
(In Gross Tons)

	August		Eight Months Ended August	
	1928	1927	1928	1927
Chile	130,800	121,300	948,300	893,600
Cuba	33,500	22,000	234,786	272,613
Spain	544	7,698	16,747	11,617
Sweden	.....	41,881	19,614	195,134
French Africa	52,474	74,579	334,605	337,623
Canada	870	5,513	45,192	13,303
Other countries	7,350	30,615	77,962	155,290
Total	225,538	303,586	1,677,206	1,879,180

Doehler Die Casting Co. Buys Equipment

The Doehler Die Casting Co., 386 Fourth Avenue, New York, has purchased from the Metal Mold Castings Co., Buffalo, its permanent mold casting equipment, dies, molds and other relative equipment which will be added to Doehler permanent mold department. The Metal Mold Castings Co. will discontinue its business.

Crumwold Furnace Sold

The Crumwold furnace at Emaus, Pa., owned by the Reading Iron Co., Reading, Pa., has been sold to the H. Sofransky Co., Allentown, Pa., and will probably be scrapped. The stack was built in 1872, rebuilt in 1909 and last relined in 1920. It had an annual capacity of 62,000 tons of foundry and forge pig iron and was last operated in 1920.

Lower Freight Rates on Scrap Recommended

WASHINGTON, Oct. 2.—Rates on scrap iron and steel, in carloads, from Newport News, Va., to certain destinations in Maryland, Delaware, New Jersey and eastern Pennsylvania would be reduced by 47c. to $1.73 per gross ton and from Newport News, Norfolk, Portsmouth and Richmond, Va., by 72c. per gross ton if the Interstate Commerce Commission act favorably on recommendations made in a report proposed by Examiner T. Leo Haden, announced last Saturday.

The report covers two cases, one being that of the Newport News Shipbuilding & Dry Dock Co., Newport News, which complained against the rates from Newport News to Maryland, Delaware, New Jersey and eastern Pennsylvania consuming points.

The other complaint was made by the United Iron & Metal Co., Baltimore, against the rates from Newport News, Norfolk, Portsmouth and Richmond to Baltimore. In disposing of the latter case the examiner recommended that the present rate of $3.78 per gross ton be reduced to $3.06 and that reparation be awarded to the complainants on that rate basis.

In the Newport News Shipbuilding cases involving rates from Newport News, which, generally, takes the same rates as Norfolk and Richmond, the examiner recommended the following reductions from Newport News.

(In Gross Tons)

To	Present Rate	Recommended Rate	Reduction
Baltimore and Sparrows Point, Md.	$3.78	$3.06	72c.
New Castle, Claymont, Del.; Chester, Coatesville, Philadelphia, York, Modena, Pa.	3.78	3.31	47c.
Columbia, Phoenixville, Conshohocken, Birdsboro, Lebanon, Reading, Pa.	4.79	3.56	$1.23
Pencoyd, Pa.	4.28	3.56	72c.
Harrisburg, Steelton, Pa.	4.54	3.56	98c.
Bethlehem, Pa.	5.54	3.81	1.73
Roebling, N. J.	5.04	3.56	1.48
Burnham, Williamsport, Pa.	5.67	4.06	1.61

Republic to Weld Pipe Up to 7-In. Electrically

YOUNGSTOWN, Oct. 2.—Recent acquisition of Steel & Tubes, Inc., by the Republic Iron & Steel Co. has aroused much interest in pipe-making processes, and a moot topic is whether the ordinary method of furnace welding of pipe will eventually be supplanted by systems now employed by Steel & Tubes and the A. O. Smith Corporation, Milwaukee, which use electricity for the welding agency on plates and strips previously bent cold.

Control of the Johnson patents for making electrically welded pipe passed to the Republic company through its absorption of Steel & Tubes, Inc. The latter has been making pipe up to 4 in. in diameter of No. 11 gage steel, and now has a machine under construction which will make pipe of 7-in. diameter of No. 10 or No. 11 gage wall thickness.

Elmer T. McCleary, president Republic Iron & Steel Co., says that his company has not yet worked out the reorganization of Steel & Tubes, Inc., or plans for extending the application of the patents obtained in the purchase of that company.

The Youngstown Sheet & Tube Co. engineers have been working on a plan for introducing electric welding, and it is said that the details are on paper for attaching to existing plate mills the equipment for bending and electrically welding plates into pipe. The Petroleum Iron Works, Sharon, Pa., has been experimenting for some time with an electric welding process.

The A. O. Smith Corporation has demonstrated the success of the system on the larger sizes of pipe and has been able to make pipe down to 8 in. diameter by its method, the interesting feature of which is the speed of production. Running on 24-in. pipe, that company has stated its ability to produce six to eight miles per day.

Conference Board for New York Iron Trade

Representatives of the warehousemen's associations and the iron contractors' associations in metropolitan New York met on Sept. 26 to organize a Conference Board for the general benefit of the iron trade in the territory. An equal number of representatives of the warehousemen's associations, the Iron and Steel Warehouse Institute and the Iron and Steel Dealers Credit Association of Greater New York, and of the contractors' associations, including the Allied Building Metal Industries, the Iron League of New Jersey, the Associated Iron Masters of Manhattan, Bronx and Westchester and the Iron League of Brooklyn and Long Island were present and selected George Boochever, attorney for the Iron League of Brooklyn and Long Island, as counsel and secretary. He was formerly treasurer of the Manhattan Knitting Mills, New York, and while in that field he drafted the code of ethics which was adopted by the National Knitted Outerwear Association.

Form New York Chapter of Scrap Institute

David Strauss, president Continental Iron & Steel Co., New York, was elected chairman of the New York chapter of the Institute of Scrap Iron and Steel, at a meeting of scrap iron dealers of New York and surrounding territory, on Sept. 27, at the Hotel Astor. The other officers of the New York chapter are: Thomas G. Watson, Brooklyn, first vice-chairman; Howard Vandewater, W. Vandewater, Inc., Brooklyn, second vice-chairman; Al Gerson, Harlem Metal Corporation, New York, secretary; Louis Fisher, Fisher Brothers Scrap Iron & Steel Co., New York, treasurer; and John McGrath, McGrath Iron Co., Inc., Brooklyn, Charles Pfeiffer, Charles Pfeiffer & Co., Inc., New York, and Harry Daly, Harry A. Daly Iron & Steel Co., Long Island City, executive committee. Herman D. Moskowitz, M. Samuels & Son, presided at the New York conference.

The New York chapter is the first of ten chapters to be organized through the Eastern section of the United States. The scrap iron dealers of Philadelphia, Chester, Pa., and Wilmington, Del., and neighboring communities met at dinner at the Manufacturers Club, Philadelphia, Oct. 2, to organize a chapter for the Philadelphia district. Joseph G. Hitner, Henry A. Hitner Sons Co., president of the institute, acted as host.

As a result of a conference addressed by Benjamin Schwartz, director general of the institute, in Springfield, Mass., New Haven and Hartford, Conn., arrangements are being made for a State conference in Hartford on Oct. 10 for the purpose of organizing a Connecticut chapter and electing officers.

Among recent applications for membership in the institute are Joseph Freedman Co., Inc., H. Goodman & Sons, and Barney Carlson, Springfield, Mass.; B. Barowsky, Holyoke, Mass.; Berman Bros., Continental Iron & Steel Co., Hausman-Wimmer Co., Thomas F. Kelly, Luria Brothers, New York Scrap Iron Co., M. Samuels & Sons, Inc., S. Snyder Corporation, Harlem Metal Co., Thomas G. Watson, New York; Harry A. Daly, Long Island City; Kingston Scrap Iron & Metal Co., Kingston, N. Y.; Charles Pfeiffer & Co., Inc., Fisher Brothers Scrap Iron & Steel Co., New York, and United Scrap Iron & Steel Co. and John V. McGrath Iron Co., Inc., Brooklyn.

Discuss Airplane Making at Wichita

Airplane engines and commercial plane production were the chief topics of discussion at an aeronautic meeting held on Sept. 21 and 22 at Wichita, Kan., under the auspices of the aeronautic division of the American Society of Mechanical Engineers. The future supply of engines, the lack of which has been seriously handicapping the manufacture of airplanes, was considered by Richard M. Mock, of the Bellanca Aircraft Corporation, in a paper at the engine session. He discussed the various types of engines on which experiments are now being made, and also those ready to go into production. R. K. Cummings, chief of the automotive power plant section, Bureau of Standards, Washington, dealt with methods and requirements in testing commercial airplane engines of medium power.

The transition of airplane construction from its formative period to one of mass production was emphasized at a symposium on commercial plane production, at which papers were presented by Walter H. Beech, president Travel Air Mfg. Co.; E. E. Porterfield, Jr., president American Eagle Aircraft Co., Kansas City, and Jerome Lederer, Aertech, Moline, Ill. The second day of the meeting was given over to inspection of local plants at Wichita, which this year are producing 25 per cent of the country's airplanes.

Ryerson Acquires E. P. Sanderson Co.

The plant, merchandise and good will of the E. P. Sanderson Co., Kendall Square, Cambridge, Mass., have been acquired by Joseph T. Ryerson & Son, Inc., Chicago. The Sanderson plant, which is one of the largest iron and steel warehouses in New England, will give the Ryerson company a large increase in plant facilities and tonnage and enable it to maintain better service in the shipment of iron and steel in New England. The kindred lines of the two companies include steel bars, reinforcing bars, shafting, I-beams, channels, angles, tees, steel sheets, steel plates, boiler tubes, rivets, bolts, nuts, etc.

New England Association Holds Fall Outing

The New England Iron & Hardware Association held its annual fall outing on Tuesday, Sept. 25, at the Tedesco Country Club, Swampscott, Mass., approximately 100 members and guests attending. The afternoon was given over to a golf tournament and the evening to dinner and presentation of prizes.

A. P. Chase, Chase, Parker & Co., Boston, with the best gross golf score, was awarded a handbag donated by Franklin E. Bragg, N. H. Bragg & Sons, Bangor, Me., president of the New England organization. Mr. Chase also won the Damon cup, donated by the Fitchburg Hardware Co., Fitchburg, Mass., which has been played for by members for three or four years.

C. B. Doten, H. L. Doten & Sons, Boston, with the second best score, was awarded a clock donated by the Bethlehem Steel Co. The best net score was halved by A. B. Peck, American Screw Co., Providence, R. I., and George M. Heath, Atlas Tack Co. Mr. Heath won the toss and selected a golf bag donated by the Central Alloy Steel Corporation, while Mr. Peck took a silver platter given by the John B. Varick Co., Manchester, N. H. With the second best net score eliminated, George E. McClintock, John B. Varick Co., with a third was awarded a dozen golf balls, as was E. C. Church, E. C. Church Co., Providence, with the fourth best net score. Three players had the fifth best net score: Peter Gray, Peter Gray & Son., Inc., Cambridge, Mass.; L. W. Barta, Avery & Saul, South Boston; and Samuel Boyed, E. Corey Co., Portland, Me. Mr. Boyed won the toss and was given a dozen golf balls. The golf balls were donated by the American Steel & Wire Co., Boston; the Standard Horse Shoe Co., Boston; and the Belcher, Loomis Hardware Co., Providence.

Columbia Steel Corporation Buying Tin Mill Units

YOUNGSTOWN, Oct. 2.—L. A. Jones, general purchasing agent Columbia Steel Corporation, San Francisco, is in the East making purchases for the new 6-mill tin plate plant which that company will build at its Pittsburg, Cal., works and which is expected to be completed and in operation next March. The new plant will be of conventional modern type, in which no attempt will be made at the outset of operations to employ, as is being done in some Eastern plants, the continuous mill for breaking down the bars. Automatic doublers, shears, a Gray type black pickling unit and all of the tinhouse equipment will be furnished by the Aetna-Standard Engineering Co., Youngstown. Six stands of hot and a like number of cold mills and the drives for them are to be let by Mr. Jones during his visit.

Manufacturers' Cooperation in Simplification

Answering the question, "Do the smaller manufacturers participate in simplification?" the division of simplified practice of the United States Department of Commerce says that 46 per cent of the 212 producer-acceptors behind 10 simplified practice recommendations are capitalized at $500,000 and over, 26 per cent between $100,000 and $500,000, and 14 per cent below $100,000. The capitalization of the remainder is not reported. Analysis of the published credit ratings of the 212 acceptors shows 41 per cent rated at $500,000 and over; 32 per cent between $75,000 and $500,000; 12 per cent between $3,000 and $75,000, and 15 per cent "not reported."

Included in the 10 recommendations reviewed are:

	Items Reduced		Per Cent Reduction
	From	To	
Files and rasps...	1,351	475	65
Range boilers.....	130	13	90
Builders' hardware:			
Items	6,948	5,130	26
Finishes	100	29	71
Eaves trough and conductor pipe..	21	16	24
Steel lockers.....	65	17	74
Sidewalk, floor and roof lights:			
Sizes	120	6	95
Styles	80	5	94
Shapes	10	2	80
Wrought iron and wrought steel pipe, valves and fittings:			
Sizes of valves and fittings...	20,000	19,238	4
Sizes of pipe....	62	49	21

All of these have been in operation sufficiently long to permit determination of the adherence accorded them by their producer-acceptors. The average adherence, i.e., per cent of product conforming to the terms of the simplification program, is 90.3 per cent. Since the division of simplified practice does not indorse and publish any recommendation until the latter has been accorded 80 per cent acceptance by the industry, according to volume of output, the figures indicate that the smaller as well as the larger companies are cooperating in simplification.

German Automobile Output Shows Increase

HAMBURG, GERMANY, Sept. 17.—Automobile production in this country is registering a steady gain, although, compared with the output of motor cars in the United States, it is of negligible size. In 1913 the total output of automobiles in Germany was 11,700; in 1925 the production was 55,000 cars; in 1926, 54,500; in 1927, 72,000 cars, and the estimate for 1928 is about 100,000. Among European producing countries Germany now ranks third; Italy was third in 1927.

About 50 per cent of the German motor car industry is controlled by the Opel Werke Russelsheim and its subsidiary companies. In addition to making 50 per cent of the passenger cars manufactured, this interest annually produces about 17,000 commercial vehicles, trucks and buses, a large proportion of which are exported. Since 1925 the average price per car manufactured in Germany has decreased about 38 per cent. In addition to the probable domestic production of 100,000 cars this year, about 22,000 cars will have been assembled by American and French plants in Germany.

German Engineers Building African Steel Plant

HAMBURG, GERMANY, Sept. 18.—Two leading engineers of Gutehoffnungshütte, Oberhausen, have been sent to South Africa, where they will work with Dr. Lilges of Gutehoffnungshütte on the construction at Daspoort of a steel works for the South African Iron & Steel Corporation, owned by the South African Government. When the plant is completed, more engineers may be sent to South Africa to aid in its operation.

New England Industrial News

The Union Water Meter Co., Worcester, Mass., pioneer in that special line, has celebrated its sixtieth business year. H. A. B. Etheredge is president and Edward S. Otis is treasurer.

George S. Case, president Peck, Stow & Wilcox Co., Southington, Conn., states that the company is completing a revamping of its mechanical equipment in the various plants. By the end of 1928 the company should be in a mechanical position to increase annual profits.

Production at the Anaconda Copper Mining Co.'s subsidiary, the American Brass Co., Ansonia, Conn., never before has been as high as it is today. Business is in such a volume that it has been necessary to reopen the so-called West rod mill, closed several years as a result of the erection of more modern shops.

The Indian Motocycle Co., Springfield, Mass, enjoying one of the most prosperous periods in its history, is continually endeavoring to widen its field of production. The company is endeavoring to perfect a motor for electric refrigeration, a smaller unit than now generally in use and simple in design. It also is developing a shock absorber, a new four-cylinder car and new motor cycle models.

The Lyman Gun Sight Corporation, Middlefield, Conn., recently acquired the gun telescope sight business of the Winchester Repeating Arms Co., New Haven, Conn., and the rights to make Garand high-speed mechanism for Garand rifles. The Middlefield company recently purchased the J. Stevens Arms Co., Chicopee Falls, Mass. It is now the largest manufacturer of gun sights in this country.

Steel Industry Thriving in Czechoslovakia

While imports of iron and steel into Czechoslovakia during the first six months of 1928 increased, totaling 142,494 metric tons, as against 90,467 tons for the corresponding period of 1927, and exports declined, amounting to 323,855 tons, compared with 334,515 tons, the industry of that country appears to be enjoying a favorable degree of activity, according to reports received by the Department of Commerce from Prague.

The great bulk of imports into Czechoslovakia during the six-month periods of both years consisted of pig iron, 73,314 tons having come in during the 1927 period and 123,813 tons during the first six months of 1928. On the other hand, exports of pig iron during the first six months of 1927, totaling 74,020 tons, were almost equalled by outgoing shipments of some of the finished lines. For the first six months of 1928 exports of pig iron, totaling 52,222 tons, were greatly exceeded by exports of some of the finished lines, including sheets and plates, with 78,678 tons, and pipe and tubes, with 69,000 tons. Exports of bars amounted to 45,446 tons; of wire, 22,645 tons, and of miscellaneous lines, 52,998 tons. Production of both iron and steel was reported to be greatly in excess of the 1927 output.

Under the new agreement with the Continental Steel Entente, Czechoslovakia retained its previous general relation to the entente, but received a concession in that it was permitted unlimited domestic production. The export quota is 432,836 tons. Production of the Czechoslovakian industry during the first six months of 1928 is estimated at 765,000 tons of pig iron and 929,000 tons of raw steel, as against 604,000 tons of pig iron and 733,000 tons of steel during the corresponding period of 1927.

In large measure exports from Czechoslovakia find their markets in adjoining or other nearby countries. The bulk of pig iron exported in 1928 went to Hungary, with considerable tonnage going to Austria and Jugoslavia. Billets were sold chiefly in Rumania, although Germany took fairly large tonnages in March and April. Iron and steel bars find a wide market. Some reach the United States, but the best outlets for this line are Rumania, Bulgaria and Great Britain, with lesser quantities going to Germany, Austria and Switzerland. Much of the iron and steel imported into Czechoslovakia is brought in from the same countries that are its best export markets.

The American Steel & Wire Co. has placed in operation a new hot-rolled strip mill at its Cuyahoga works, Cleveland. It has a capacity for rolling material in widths from 1 in. to 3½ in. and in thicknesses from No. 23 gage to ¼ in. The product of the new mill will be used exclusively in the company's cold-rolled strip mill.

This Issue in Brief

Fairly stable and large volume of business during the remainder of the year, with fair to good earnings for the average company, is forecast by P-V Line.—Page 833.

* * *

Dies of high-speed steel favored for copper-rich die castings. Tests reveal that mild steel corrodes rapidly. Chromium plated steel resists attack, but frequent heating and cooling causes the plating to flake off.—Page 814.

* * *

Cuts annealing time in half by forced cooling. After critical range is passed, cooling of material in electric furnace is accelerated by air blown through system of cooling pipes.—Page 818.

* * *

In a bearing operating continuously, rise in temperature is independent of the length of the bearing, says machine tool builder. Temperature increase is proportional to bearing diameter, to operating viscosity of lubricant, and to the square of number of r.p.m., and is inversely proportional to the running clearance.—Page 822.

* * *

"Man factor" is an important consideration in industrial improvements. If the workman can be induced to realize the necessity for proposed changes, his efforts will contribute largely to the success of the undertaking.—Page 822.

* * *

Increase in machined surfaces on farm equipment point to larger use of machine tools. Machined steel parts are being substituted for castings, cut gears for cast gears, and anti-friction bearings are more widely employed, says farm equipment manufacturer. All these changes call for more careful machining.—Page 823.

Chromium-plated cutting tools chip off at the cutting edge when working on steel or cast iron, says electric equipment manufacturer. But the plated tools are satisfactory when used on materials other than metals.—Page 824.

* * *

Can galvanizers produce spangles if pure zinc is used? Yes, but only for a short period of time, says metallurgist, for after a few days the bath surface oxidizes if no metallic additions are made to the bath.—Page 812.

* * *

Stronger ring gear blanks, with very little waste metal, are produced by upsetting process. An upsetting die punches into the center of the bar and mushrooms the head into "doughnut" shape, with the highly refined metal from the surface of the bar on the side of the "doughnut" where the teeth of the gear will be cut.—Page 816.

* * *

Porosity in zinc-base die castings depends almost entirely on the kind of pull given the lever, investigators declare. Tensile strength of sound castings is little affected by reasonable changes in casting conditions.—Page 814.

* * *

Electric furnace for normalizing alloy steel has three pusher mechanisms, two at the charging end and one at the side. The latter pushes the charge across the width of the furnace, from charge to discharge side. Pushing is done by shoes operating in troughs, which are returned to the loading end by a conveyor.—Page 819.

* * *

Export business in machinery and steel continues to grow. Machinery sales for first eight months exceed same period of 1927 by more than 13 per cent, while finished steel sales gain 9 per cent.—Pages 870-872.

Buys new equipment when cost of repairing old is over half the purchase price of the new machine. Automobile manufacturer makes extensive repairs to old equipment only when the machine is of a special type and when it would have only a small resale value.—Page 824.

* * *

Low-chromium alloy steel rails last several times as long as Bessemer rails in many kinds of service. The alloy rails can be drilled without difficulty and do not air-harden after heating for bending. —Page 826.

* * *

Friction absorbs almost one-half the power created by rolling mill engine, says lubricating engineer. About 27 per cent of power is used in overcoming friction in engine parts, 13 per cent in overcoming rolling mill friction, and 9 per cent in overcoming pinion and spindle friction.—Page 827.

* * *

In galvanizing bath lead is not harmful, says metallurgist, for it alloys with zinc only in very small quantities, the excess lead settling to the bottom of the pot. But high iron content affects both the physical and the chemical qualities of slab zinc.—Page 813.

* * *

Compactness an important factor in machine tool design, says automobile manufacturer. The compactly built machine has many advantages over the machine with projecting parts, which make it difficult to place in progressive lineup.—Page 824.

* * *

Net gain during September of 14 blast furnaces in operation presages heavier production in October. Particularly significant was the gain of five merchant stacks, accompanied by an increase of 5½ per cent in daily production of merchant iron.—Page 844.

A. I. FINDLEY
Editor

THE IRON AGE

W. W. MACON
Managing Editor

ESTABLISHED 1855

Better Selling of Steel

FULLY granting that the steel trade needs better merchandising methods, as has been urged by C. M. Schwab and others for a year past, it is worth while to reflect upon the great improvement in present methods over those in force before the war. Then the sellers were opportunists, carried along, and quite nicely at times, by circumstances. They criticized their methods and talked about reforms which they never seriously attempted to make. In a strong market they simply sold farther and farther ahead at successively rising prices. The sales were in the form of "contracts" which really amounted to options given the buyers. In a weak market they strove to squeeze specifications out of the remaining contracts, making downward price readjustments from time to time as circumstances seemed to force them. They complained of "the contract evil" because some customers nursed their contracts and avoided paying anything like the full open market advances while in a declining market they refused to specify; i.e., they chose not to exercise their options, which no longer had any value.

There was so little understanding of the rationale of equitable distribution of merchandise that mills talked of "enforcing" contracts and "making contracts binding," when the apparent transactions represented by the "contracts" were not by their nature susceptible of such treatment, since they were not actual sales. The only feasible reform was to abolish that form of contracting and the mills were afraid to attempt anything of that sort.

Today there is true merchandising, even though it may not be altogether good merchandising. The seller considers the circumstances of the buyer and would not force him to a loss on account of his having signed some sort of a paper. Rarely if ever did they force losses in the old days but there was much difference in profits between customers according to the kind of contract or option they had secured long previous, by chance or skill. Some customers profited hugely.

Nowadays all business is conducted on small margins and mills recognize that their customers need to be placed on the same basis as competitors. That is good merchandising and it is a vast improvement over the old way. There are contracts now, but they are only quarterly, a much smaller proportion of the steel moves under contract than formerly, and the ambition of mills is to set up a general practice requiring the completion of a quarter's specifications by the 10th or 15th of the last month in the quarter.

In several finished steel lines an improvement has been made by setting up quantity differentials for small lots in a shipment. This is better than the practice of the recent past, but comparison cannot be made with earlier pre-war years, for then there was practically no such thing as small-lot shipments by mills. As a rule they were not in position to make such shipments.

In respect to quality extras the mills have not kept pace with the times. Steel used to be pretty much the same. Now there is increasing variety, as new uses and new requirements arise. This diversity will continue, and if its demands upon salesmanship are to be properly met prices and extras must be fitted to the cost of production and to the relative values of the materials furnished.

From Winnipeg to Buenos Aires

FIGURES could be assembled in imposing array giving in tens of millions the value of our iron and steel exports and in hundreds of millions the value of automobiles, machinery and equipment made largely from iron and steel. But the important conclusion from such a showing would be that this export movement is so large a part of our total production that its continuance or disappearance might mean the difference between prosperity and hard times at home.

Other analyses would show the destination of these exports. Getting down to essentials, we should find that America, North and South, is our own best customer. Canada absorbs most, due to propinquity and the common interests of these English-speaking nations. But an increasing amount goes south to Latin America. Our southern customers include Cuba and the other islands, Mexico and other Central American republics, and all the great states in South America. Trade with many of these has risen sharply since the war for three principal reasons: because United States corporations have developed properties and concessions within the borders of our southern neighbors, because the Governments of the latter have been large borrowers in Wall Street, and because our own export organizations have been able to meet open competition for available business.

Such facts have been the basis of statements made more than once in these columns that the countries to the south of us offer the best outlet for our future surplus in manufactures. Ways and means of fostering this trade have been discussed. Not least among these business aids are a sympathetic understanding between the peoples and ready means of communication.

Both of these will be promoted mightily by the construction of a broad, modern highway down the backbone of the two continents. The project has already had some publicity. The daily press has reported that President Coolidge and Herbert Hoover have approved

it. We are bound to hear more about it, for it is a logical way of bringing the people of these two continents into closer contact and of promoting good feeling. What would change the average Kansan's contempt for a "greaser" sooner than an automobile trip to Mexico City over a cement pavement? Nor would a Sonora rancher use the scornful "gringo" if he could tour the United States.

The tremendous traffic over our own Lincoln Highway (to mention but one) indicates what might be expected of a north-and-south route in times of peace. What such a protected, inland road would mean in war time has been understood ever since the Romans built their indestructible roads, and has been demonstrated in every war fought in the last 2000 years. "Communications" the commanding officer must safeguard first of all. In our own defense the highway would carry north essential supplies of rubber, manganese, nitrates, foodstuffs, releasing fleets of cruisers and cargo ships for other services. In our neighbors' defense it would carry south all the machinery of modern war.

Communications, mutual understanding, trade, defense, all require such a road. It should not be long postponed.

Labor as a Commodity

ONE of the inconsistencies in the tenets of labor unions is their insistence that labor is not a commodity and their common treatment of labor questions as if it were. This may be explained, however, in that it is a truism that labor is not a commodity; but it is likewise true that labor theoretically obeys the economic laws (especially that of supply and demand) which commodities obey. The national economy of this and every other country is a composite of goods and service. All of us are salesmen. The stevedore sells his muscle. The engineer sells his knowledge. In each case and in every other the remuneration is determined by the supply of the kind of service that can be rendered and the demand for it. The man who is unique can well nigh get whatever he asks if any one needs him. The man who is ordinary can get only a competitive price, unless competition be nullified; and that is a great objective of labor unionism. Perhaps it is the one great objective, and perhaps it is this that underlies the emphasized reiteration that labor is not a commodity.

The stage hands of New York, who number about 2000, were recently discussing with their employers the matter of increased remuneration, and they secured advances to $82.50 per week for carpenters and electricians, while ordinary stage hands are now to get $6.75 per performance. We conjecture that the art of being a stage hand does not require more than a few days training, and no doubt many college graduates would be attracted by the handsome remuneration named. But what would happen if they applied for these jobs? We need not answer the question. This is an example of the noncompetitive condition labor unions create in what they say is not a commodity.

So it is with building mechanics and men of many other vocations in unionized territory who assume the principles and practice of a monopoly for their respective guilds. Competition between workers in the sense of an open market is the last thing in the world they think of permitting. Their only deference to economic law is to increase their efficiency when demand is poor and to decrease it when demand becomes strong. This may explain in part why their leaders do not like to have labor referred to as a commodity.

Heavy Steel Export Movement

IRON and steel exports from the United States in August were larger than in any month since early 1921. However, so much scrap was included that the amount of finished material was less than that recorded for each of six months in the past seven-and-a-half years. Of the 287,297 tons exported in August, no less than 70,538 tons was iron and steel scrap. The highest previous tonnage of scrap went out in June—64,918 tons. The five months ended with August have shown an outward scrap movement of 279,272 tons, each of these months having been above 40,000 tons. Only once before (September, 1920) was 40,000 tons reached. Italy, Germany, Japan and Canada have been buyers of American steel melting scrap for some months on an unusual scale.

Finished products exported in August amounted to 179,085 tons, the largest total since the 196,734 tons of January, 1927. Semi-finished exports were 20,020 tons, the largest (except for last May) in eight years, or since August of 1920. Pig iron and ferroalloys, at 9445 tons, fell below the previous month, but with that exception led all the months since June, 1926. The total of iron and steel exports for the eight months, excluding scrap, was nearly 14 per cent ahead of last year's for the like period. With scrap included, the eight months' tonnage was above the twelve months' total of 1925 or 1924.

Coal Value Lower in Strike Year

DESPITE the union bituminous coal strike which began April 1, 1927, and technically is not ended yet, the average value of coal at mines decreased from 1926 to 1927. Bituminous coal dropped from $2.06 to $1.99. Anthracite, with no strike, dropped from $5.62 to $5.26. Bituminous prices are running still lower this year.

The final figures now compiled show total bituminous coal production in 1927 at 517,763,352 net tons, which represents 9.7 per cent decrease from 1926. The price record shows that there was an ample supply of coal. The decrease in tonnage may be ascribed in part to the laying in of stocks late in 1926 against the expected strike, to a little decrease in industrial activity in the latter part of 1927, and to the exceptional 1926 exports due to the British coal strike.

It is not true that the total consumption of bituminous coal has been decreasing. Demand merely failed to increase as formerly, and thus with increasing capacity prices could not hold. The gain in production has been insignificant in recent years. It was rapid through 1912 and 1913, each of those years making a new record by a large margin; but the combined production of 1926 and 1927 exceeded the 1912-13 production by only 17.5 per cent, with a lapse of 14 years. Widespread economies in the use of coal account for the small increase, when the service rendered, with

the large expansion in industrial operations, increased so greatly.

In the bituminous industry the average number of days worked decreased from 1926 to 1927 by 7½ per cent, from 215 days to 199 days, when production, as shown above, decreased by slightly less. The average output per man per day increased from 4.50 to 4.55 net tons, showing that the switching of production from union to non-union did not involve a decrease in efficiency.

The quantity of coal coked at mines decreased from 17,751,549 tons in 1926 to 10,719,633 tons in 1927, showing a further dwindling in the amount of beehive coking. The 1927 quantity coked was only 2.1 per cent of the total production.

Bituminous production is running still lighter this year. All this simply means that there is no hope of coal miners receiving what could be called good wages, when there are so many more men anxious to mine coal than the coal requirements of the country can engage. More light could be thrown upon this vexed coal problem if more attention were given to the mental or human side. Why do men become coal operators and coal miners? Many have become operators because they chanced to own coal lands and were not willing to wait until the demand really worked around to them.

WITH a world's production of over 206,000 metric tons, last year made a new record for the aluminum industry, assuming the correctness of data published by a German statistical bureau. American preeminence is marked, domestic plants producing 75,000 tons or 36 per cent of the total, against 35 per cent in 1926. American consumption (including Canada) at 88,000 tons last year compares with 106,000 tons in 1926; but there was a marked increase in the German consumption, which was 35,900 tons, or 60 per cent more than in 1926. In the next year or so, however, American consuming industries promise to forge ahead, as the development and use of new light, strong alloys are rapidly extending. In this connection the expansion of our aircraft industry is a highly important factor. World production and consumption of aluminum are now about three times the rate just before the war, while American output is over four times and consumption about two-and-a-half times that of 1913.

AN illuminating example of the counterplay of economic forces is quoted in a recent British official report on business in Belgium. Commenting on the difficulties of the machinery manufacturers, it notes the formation of various amalgamations and cartels for control of the markets at home and abroad, evidently for one main purpose—to increase the amount of money secured for the product. That such a movement can be carried too far, and also is vulnerable to attack, appears from a statement on the next page of the same report: "The Garagists' Association has secured the cooperation of the trade association of motor car dealers to form a 'Tires Purchase Syndicate' for breaking the monopoly exactions of the tire manufacturers' ring, and for facilitating distribution and supply of tires to members." Whenever producers organize a really effective monopoly, consumers set out forthwith to "break the ring!"

CORRESPONDENCE

Investors and the Stock Market

To the Editor: Your editorial on page 779 of the Sept. 27 issue asks "Why This Stock Market?" and then answers the question very ably. While I agree with all you say, I think there is another factor that is generally overlooked.

I refer to the present stagnant and depressed condition of the real estate market, especially with respect to one and two family private residences. The time is not so far back when the average man of the middle class in income, having secured his own home and accumulated additional reserve, bought another similar residence to rent. Here was a transaction he knew how to handle, which yielded him a safe income, also a probable increase in value, and gave him community prestige. But times have changed. A private residence for rent is at best only likely to bring normal interest on its cost, and ofttimes only pays expenses, with no return on the investment. Many residential centers are overbuilt; the trend toward apartment houses in our large cities is in full swing, and houses are not renting. The man of small means with a little surplus hesitates at putting it in a house to rent today. He thinks of all the problems of painting, repairs, taxes, uncollected rent, vacant property, and inability to sell when he wants to; and unless he believes the particular property has business possibilities he turns to the stock market.

Why? Because in the stock market he has but three problems to face—when to buy, when to hold and when to sell. All details of the management of the investment are out of his hands; he has nothing to watch but the stock quotations. If he has made an unfortunate buy, he can liquidate at any time, take his loss and start over. Not so with private residential real estate. He has the ever recurring details to decide and often he cannot sell when he would like to, at any price. Is it any wonder that, having discovered the stock market, which he can enter with a small investment, gradually increasing his holdings, he is going to it to an increasing extent? If, as pointed out in the editorial, he is investing in sound organizations and businesses regardless of present dividend rates, his regularly increasing participation is increasing the demand and putting prices up gradually to a high level. This situation is, to my mind, no small factor in the answer to the question, "Why this stock market?"

JOHN F. HARDECKER.

Brocklawn, N. J., Sept. 28.

Railroad Facts

A year book on **railroad information,** 1928 edition, has been put out by the Western Railways' Committee on Public Relations, Chicago. It consists of 96 pages with diagramatic illustrations and a five-page index. The book shows the growth of the railroad physical plant in mileage, locomotives, cars, etc., with comparisons with other countries, the growth in the money investment of the plant, the growth in car loadings year by year, and a considerable amount of collateral or derived information of special interest to those studying the railroad situation. Particularly are shown the reductions in fuel required for a given traffic performance, the elimination of car shortages, increase in freight train speeds and in tonnage carried by the average train.

Fabricated Structural Steel

New York Subways Call for 15,100 Tons—Week's Awards Total 33,850 Tons and New Projects 41,000 Tons

WITH two sections of the New York subway calling for 15,100 tons, and approaches to the Detroit River tunnel, 4500 tons, new projects reported during the week totaled 41,000 tons. Awards amounted to 33,850 tons, the largest having been a manufacturing building at Meadville, Pa., requiring 4500 tons. Awards follow:

BOSTON, 127 tons, building alterations on Boylston Street, to unnamed fabricator.

STATE OF VERMONT, 150 tons, highway bridge, to American Bridge Co.

NEW YORK, 2000 tons, addition for R. H. Macy & Co., to Levering & Garrigues Co.

NEW YORK, 1300 tons, building in East Tenth Street for Sailors Snug Harbor, to Hedden Iron Construction Co.

NEW YORK, 1200 tons, apartment building at 101st Street and Fifth Avenue, to Harris Structural Steel Co.

NEW YORK, 1000 tons, apartment building at 107th Street and Broadway, to Easton Structural Steel Co.

NEW YORK, 238 tons, New York Central Lines, Mott Haven yard improvements, to Jones & Laughlin Steel Corporation.

HEMPSTEAD, N. Y., 200 tons, Professional Building, to Hay Foundry & Iron Works.

GOWANDA, N. Y., 250 tons, State bridge, to American Bridge Co.

JEROME, PA., 160 tons, Hillman Coal & Coke Co. coal storage bins, to Jones & Laughlin Steel Corporation.

MERCER COUNTY, N. J., 100 tons, bridge, to N. A. K. Bugbee.

PHILADELPHIA, 550 tons, Circle Theater at Frankford, to Bethlehem Fabricators, Inc.

PHILADELPHIA, 210 tons, building at Broad and South Streets for Southwestern National Bank, to S. G. Matthews, Philadelphia.

PHILADELPHIA, 260 tons, mill building for Heintz Mfg. Co., to Lehigh Structural Steel Co.

MEADVILLE, PA., 4480 tons, plant for Viscose Co.

WAYNESBORO, VA., 2400 tons, buildings for Du Pont Engineering Co., to Virginia Bridge & Iron Co.

QUANTICO, VA., 300 tons, Marine barracks, to Virginia Bridge & Iron Co.

WASHINGTON, 2300 tons, office building for Southern Railway Co., to Barber & Ross.

CANTON, N. C., 150 tons, bridges, to Austin Brothers Co.

PENSACOLA, FLA., 200 tons, airplane hangar and station, to Ingalls Iron Works Co.

TUSCALOOSA, ALA., 180 tons, Gulf States Paper Corporation plant, to Ingalls Iron Works Co.

MEMPHIS, TENN., 950 tons, floor repairs for Harahan Bridge, to American Bridge Co.

CINCINNATI, 550 tons, building for Container Corporation of America, to Oregonia Bridge Co.

LOCKLAND, OHIO, 1000 tons, manufacturing building for Tennessee Copper & Chemical Co., to Fort Pitt Bridge Works; reported last week to unnamed fabricator.

ZOARVILLE, OHIO, 270 tons, highway bridge; from E. Elford & Sons Co., general contractor, to Massillon Bridge & Structural Co.

CLEVELAND, 430 tons, building for Eaton Axle & Spring Co., to McClintic-Marshall Co.

GRAND FORKS, N. D., 1177 tons, Red River bridge, to Minnesota Steel & Machine Co.

GREAT NORTHERN RAILROAD, 1900 tons, bridges, to American Bridge Co.

CHICAGO, 2800 tons, garage, to American Bridge Co.

STATE OF ILLINOIS, 1000 tons, highway bridges, distributed among several unnamed fabricators and Continental Bridge Co.

ST. LOUIS, 200 tons, bridge for Southern Railway, to American Bridge Co.

GROTTO, WASH., 140 tons, crane runway for Northwestern Portland Cement Co., to Wallace Bridge & Structural Steel Co.

SAN FRANCISCO, 1550 tons, five 80,000-bbl. tanks for Shell Oil Co., to Western Pipe & Steel Co.

SAN FRANCISCO, 100 tons, hotel, Eddy Street near Hyde, to McClintic-Marshall Co.

STOCKTON, CAL., 130 tons, two plants for Fibreboard Products Co., one at Antioch and one at Stockton, to Moore Drydock Co.

SANTA BARBARA, CAL., 1550 tons, five 80,000-bbl. tanks for Rio Grande and Barnsdall Oil companies, to McClintic-Marshall Co.

LOS ANGELES, 1200 tons, Richfield Oil building, to Llewellyn Iron Works.

LOS ANGELES, 800 tons, three apartment buildings, to Union Iron Works.

SAN DIEGO, CAL., 725 tons, warehouse for Navy Department, to Llewellyn Iron Works.

SAN DIEGO, 525 tons, Fox Realty building, to Llewellyn Iron Works.

SANTA ANA, CAL., 100 tons, store, Second Street and Broadway, to Union Iron Works.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

NEW YORK, 15,100 tons, subway work; 3600 tons in section 5-A, route 109, bids Oct. 9, and 11,500 tons in section 2-A, route 108, bids Oct. 11.

NEW YORK, 500 tons, Junior League building in East Seventy-first Street; George A. Fuller Co., general contractor.

STATE OF NEW YORK, 200 tons, highway bridges.

ROCHESTER, N. Y., 450 tons, baseball grandstand.

WILKES-BARRE, PA., 400 tons, Bell Telephone Co. building.

BALTIMORE, 1600 tons, pier shed at McComas Street terminal improvement.

VIRGINIAN RAILWAY, 300 tons, bridge.

DETROIT, 4500 tons, approaches to Detroit River tunnel.

CINCINNATI, 2000 tons, building for Union Gas & Electric Co.; bids Oct. 10.

CHICAGO, 2600 tons, three junior high schools.

CHICAGO, 850 tons, two buildings for University of Chicago.

CHICAGO, BURLINGTON & QUINCY RAILROAD, 1500 tons, bridge and other work.

ILLINOIS CENTRAL RAILROAD, 400 tons, bridge work.

DULUTH, MINN., 1500 tons, reconstruction of bridge.

DAVENPORT, IOWA, 500 tons, bridge for Chicago, Rock Island & Pacific.

HERMANN, MO., 2500 tons, toll bridge across Missouri River.

PITTSBURG, CAL., 2500 tons, tin plate mill building for Columbia Steel Co.; bids received.

LOS ANGELES, 2000 tons, Bullock's department store, Wilshire Boulevard; bids received.

LOS ANGELES, 160 tons, apartment building at Beverly Hills; bids being taken.

OLYMPIA, WASH., 230 tons, Kalama River bridge; general contract to Gilpin Construction Co., Astoria, Ore.

OLYMPIA, 120 tons, Coweeman River bridge; general contract to J. J. Badraun, Portland, Ore.

PORTLAND, ORE., 243 tons, Gardiner bridge over Yellowstone River in Montana; bids opened.

HOOD RIVER, ORE., 1200 tons plates, pipe line; bids Oct. 10.

Steel Tariff Agitation On in Canada

TORONTO, ONT., Oct. 2.—Conflict has arisen between the two largest steel companies in Canada as to the fiscal policy best suited to their interests. Over a year ago the British Empire Steel Corporation applied to the Tariff Advisory Board for a recommendation favorable to a bounty on steel and the removal of the drawback on coal used in its production. The Steel Co. of Canada, Ltd., Hamilton, Ont., through its president, Ross H. McMaster, has just filed a lengthy brief with the Tariff Board now in session at Ottawa, Ont., opposed to the British Empire Steel Corporation's argument. It opposes the bounty system as a means of aiding the industry as distinguished from a tariff, while it also strongly resists any proposal of removing the drawback on coal used in the production of steel. The general claim is that what is proposed by the British Empire Steel Corporation is not for the benefit of the steel industry as a whole, but instead only for one company and one locality, the Maritime Provinces, a policy which is not considered in the public good.

The application of the Algoma Steel Corporation for tariff changes will be heard by the Advisory Tariff Board, at Ottawa, beginning today. Alterations suggested in the application would abolish drawbacks in some instances and impose new or higher duties in others. It is proposed to abolish the drawback of 99 per cent of duty on steel for springs and axles used in the manufacture of automobiles. The brief says: "It is acknowledged that the automobile industry is reasonably protected under the present Canadian tariff and there appears no justification for allowing spring steel or axle steel bars for automobiles to be imported from foreign sources under a rebate of 99 per cent of the duty." The proposed changes would still allow such steel to come in under the drawback when used in the manufacture of agricultural implements. It is also asked that imported spiral spring steel be no longer subjected to a 99 per cent drawback when used in the manufacture of railroad spiral springs. The brief urges the imposition of a duty of 35 per cent ad valorem general and British preference on alloy steel.

Small Gain in September Iron Output

Daily Rate Last Month Gained 897 Tons or Nearly One Per Cent Over August—Net Gain of 14 Furnaces

SEPTEMBER pig iron output, from data collected largely by wire on Oct. 2, made a small increase over August. There was, however, a large net gain in furnaces, most of them put in operation during the closing days of the month. Seventeen were blown in and three shut down, a net gain of 14.

Total September coke pig iron output was 3,062,314 gross tons or 102,077 tons per day for the 30 days as contrasted with 3,136,570 tons or 101,180 tons per day for the 31 days in August. This is an increase of 897 tons per day or 0.88 per cent. In August the increase was 2089 tons or 2.1 per cent. The September daily rate last year was 92,498 tons, which was a decline from August of that year of 2575 tons. As in August this year, the September output showed an increase over the preceding month, contrasting with decreases last year.

Capacity Active on Oct. 1

On Oct. 1 there were 197 furnaces active having an estimated operating rate of 106,755 tons per day. This compares with an operating rate of 98,730 tons per day for the 183 furnaces active on Sept. 1. Many furnaces during September were operated at a higher rate than in August.

Of the 17 furnaces blown in during September, six were Steel Corporation stacks, five belonged to independent steel companies and six to merchant producers. Only two Steel Corporation stacks were blown out and one merchant stack. Thus the gain for the month was nine steel-making furnaces and five merchant.

Steel and Merchant Iron

Steel-making iron last month was made at the rate of 82,590 tons per day or slightly less than the 82,642 tons per day in August. There was an increase in the merchant iron daily rate of production in September over August, or 19,487 tons per day against 18,538 tons per day.

Furnaces Blown In and Out

During September the following furnaces were blown in: One Susque-

Daily Average Production of Coke Pig Iron in the United States by Months Since Jan. 1, 1924—Gross Tons

	1924	1925	1926	1927	1928
Jan.	97,384	108,720	106,974	100,123	92,573
Feb.	106,026	114,791	104,408	105,024	100,004
Mar.	111,809	114,975	111,032	112,366	103,215
Apr.	107,781	108,632	115,004	114,074	106,183
May	84,358	94,542	112,304	109,385	105,931
June	67,541	89,115	107,844	102,988	102,733
½ year	95,794	105,039	109,660	107,351	101,763
July	57,577	85,936	103,978	95,199	99,091
Aug.	60,875	87,241	103,241	95,073	101,180
Sept.	68,442	90,873	104,543	92,498	102,077
Oct.	79,907	97,528	107,553	89,810	.....
Nov.	83,656	100,767	107,890	88,279	.....
Dec.	95,539	104,853	99,712	86,960	.....
Year	85,075	99,735	107,043	99,266	.....

Pig Iron Production by Districts, Gross Tons

	September (30 days)	August (31 days)	July (31 days)	June (30 days)
New York and Mass.	183,557	188,399	192,126	199,045
Lehigh Valley	78,272	72,648	64,921	60,640
Schuylkill Valley	51,116	52,231	53,855	52,434
Lower Susq. and Lebanon Valleys	30,680	33,153	30,079	29,207
Pittsburgh district	622,023	628,471	586,923	606,223
Shenango Valley	86,136	86,691	88,366	101,543
Western Pennsylvania	138,021	138,253	120,389	117,833
Maryland, Va. and Ky.	113,108	112,555	111,741	116,691
Wheeling district	149,813	157,507	154,636	145,717
Mahoning Valley	309,512	307,547	287,688	291,174
Central and North'n Ohio	328,382	376,706	379,277	349,952
Southern Ohio	45,363	46,367	44,339	40,810
Illinois and Indiana	609,891	625,452	636,961	635,201
Mich., Minn., Mo., Wis., Colo. and Utah	112,030	113,737	122,875	127,085
Alabama	197,367	188,896	189,383	200,643
Tennessee	7,043	7,957	8,265	7,802
Total	3,062,314	3,136,570	3,071,824	3,082,000

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works Iron	Merchant Iron*	Total
September, 1927	69,673	22,825	92,498
October	66,991	22,819	89,810
November	64,600	23,679	88,279
December	64,118	22,742	86,960
January, 1928	69,520	23,053	92,573
February	78,444	21,560	100,004
March	83,489	19,726	103,215
April	85,183	21,000	106,183
May	85,576	20,355	105,931
June	81,630	21,103	102,733
July	79,513	19,578	99,091
August	82,642	18,538	101,180
September	82,590	19,487	102,077

*Includes pig iron made for the market by steel companies.

Coke Furnaces in Blast

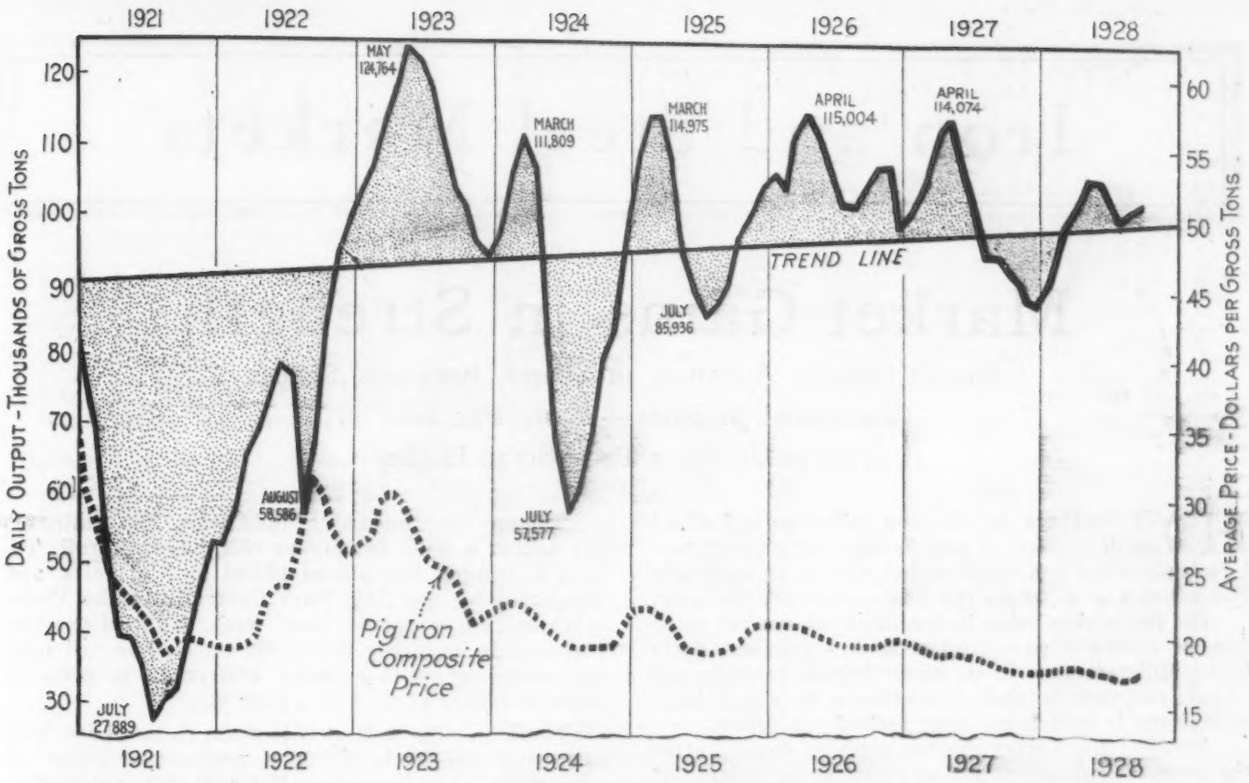
Furnaces	Oct. 1 Number in Blast	Oct. 1 Capacity per Day	Sept. 1 Number in Blast	Sept. 1 Capacity per Day
New York:				
Buffalo	11	5,640	10	5,380
Other N. Y. and Mass.	2	880	2	835
New Jersey	0	....	0	....
Pennsylvania:				
Lehigh Valley	6	2,600	6	2,350*
Schuylkill Valley	5	2,000	4	1,685
Susquehanna Valley	2	940	2	990
Ferromanganese	0	....	0	....
Lebanon Valley	0	....	0	....
Ferromanganese	1	80	1	75
Pittsburgh District	35	22,100	31	19,190
Ferromanganese	2	320	2	300
Shenango Valley	6	3,300	5	2,780
Western Pennsylvania	9	4,400	9	4,300
Ferromanganese	1	180	1	180
Maryland	5	2,770	5	2,620
Wheeling District	8	4,990	8	5,070
Ohio:				
Mahoning Valley	18	10,400	17	9,650
Central and Northern	18	10,945	18	11,700
Southern	4	1,540	4	1,490
Illinois and Indiana	30	20,960	28	19,660
Mich., Wis. and Minn.	5	2,200	5	2,170
Colo., Mo. and Utah	4	1,600	3	1,150
The South:				
Virginia	1	145	1	220
Ferromanganese	0	....	1	80
Kentucky	2	760	2	680
Alabama	19	7,700	15	5,840
Ferromanganese	1	70	1	70
Tennessee	2	235	2	265
Total	197	106,755	183	98,730

*Includes spiegeleisen.

Production of Coke Pig Iron in United States by Months, Beginning Jan. 1, 1926—Gross Tons

	1926	1927	1928
Jan.	3,316,201	3,103,820	2,869,761
Feb.	2,923,415	2,940,679	2,900,126
Mar.	3,441,986	3,483,362	3,199,674
Apr.	3,450,122	3,422,226	3,185,504
May	3,481,428	3,390,940	3,283,856
June	3,235,309	3,089,651	3,082,000
½ year	19,848,461	19,430,678	18,520,921
July	3,223,338	2,951,160	3,071,824
Aug.	3,200,479	2,947,276	3,136,570
Sept.	3,136,293	2,774,949	3,062,314
Oct.	3,334,132	2,784,112	.....
Nov.	3,236,707	2,648,376	.....
Dec.	3,091,060	2,695,755	.....
Year*	39,070,470	36,232,306	.....

*These totals do not include charcoal pig iron. The 1927 production of this iron was 164,569 tons.



Daily Pig Iron Output in September Was 0.88 Per Cent More Than in August; Composite Prices Substantially Unchanged

Inclined line represents the gradually increasing theoretical needs of the country, ascertained by a balancing of the ups and downs in production. It shows an average yearly increase in consumption of about 415,000 *tons*

hanna stack of the Hanna Furnace Co. in the Buffalo district; the Brooke furnace in the Schuylkill Valley; one Carrie and one Clairton stack of the Carnegie Steel Co., one Midland stack of the Pittsburgh Crucible Steel Co. and one Monessen stack of the Pittsburgh Steel Co. in the Pittsburgh district; one Haselton furnace of the Republic Iron & Steel Co. in the Mahoning Valley; the Sharpsville furnace in the Shenango Valley; one Joliet and one Gary stack of the Illinois Steel Co., one Federal furnace and one Iroquois stack of the Youngstown Sheet & Tube Co. in the Chicago district; one furnace of the Colorado Fuel & Iron Co. in Colorado; one furnace of the Gulf States Steel Co., one Woodward stack of the Woodward Iron Co. and one Bessemer and one Fairfield stack of the Tennessee Coal, Iron & Railroad Co. in Alabama.

The three furnaces blown out or banked were the Pulaski stack in Virginia and one Joliet and one South Chicago furnace of the Illinois Steel Co. in the Chicago district.

Possibly Active Stacks Unchanged

The Crumwold furnace of the Reading Iron Co. in the Lehigh Valley has been sold and will probably be dismantled. The new No. 6 Fairfield stack of the Tennessee Coal, Iron & Railroad Co. at Fairfield, Ala., was blown in during the month, leaving the number of possibly active furnaces in the United States unchanged at 339.

Production of Steel Companies for Own Use—Gross Tons

	Total Pig Iron Spiegel and Ferromanganese			Ferromanganese*		
	1926	1927	1928	1926	1927	1928
Jan.	2,599,876	2,343,881	2,155,133	29,129	31,844	22,298
Feb.	2,272,150	2,256,651	2,274,880	22,309	24,560	19,320
Mar	2,661,092	2,675,417	2,588,158	24,064	27,834	27,912
Apr.	2,677,094	2,637,919	2,555,500	24,134	24,735	18,405
May	2,687,138	2,619,078	2,652,872	23,159	28,734	29,940
June	2,465,583	2,343,409	2,448,905	25,378	29,232	32,088
½ year	15,362,933	14,876,355	14,675,448	148,173	166,939	149,963
July	2,461,161	2,163,101	2,464,896	26,877	26,394	32,909
Aug.	2,424,687	2,213,815	2,561,904	23,557	21,279	24,583
Sept.	2,436,733	2,090,200	2,477,695	25,218	20,675	22,278
Oct.	2,578,830	2,076,722	.....	28,473	17,710	.....
Nov.	2,484,620	1,938,043	.....	31,903	17,851	.....
Dec.	2,322,180	1,987,652	.....	31,627	20,992	.....
Year	30,071,144	27,345,888	.....	315,828	291,840	.....

*Includes output of merchant furnaces.

Fabricated Plate Orders Much Higher

WASHINGTON, Oct. 2.—Orders for fabricated steel plate in August totaled 47,245 tons, or 59.9 per cent of the capacity of the 51 companies reporting to the Department of Commerce. Orders in July were 35,959 tons, or 46.8 per cent of capacity. August orders were distributed as follows: Oil storage tanks, 24,807 tons; refinery materials and equipment, 1724 tons; tank cars, 892 tons; gas holders, 1814 tons; blast furnaces, 429 tons; stacks and miscellaneous, 17,579 tons.

Tests of the new Diesel type aircraft engine developed by Capt. L. M. Woolson, of the Packard Motor Car Co., are being made at the Packard proving grounds near Utica, Mich. Col. J. G. Vincent, vice-president in charge of engineering for Packard, is directing the work. Dr. Hermann Dorner, a German authority on Diesel engines, and Adolph Widman have been assisting Captain Woolson in the development work. The new Packard engine weighs less than 3 lb. per hp. developed, as compared with 100 lb. per hp. for light Diesel engines previously produced.

Iron and Steel Markets

Market Gains in Strength

Fourth Quarter Advances in Sheets, Bars and Shapes Established in Sales — Basic Pig Iron in Valleys Up 75c. a Ton—Scrap Higher

HEAVY bookings, lengthening deliveries and added strength in prices of both finished and primary materials place the iron and steel industry on an unusually stable basis as it enters the final quarter of the year.

The September bulge in specifications against third quarter contracts gave steel producers excellent backlogs. Mills are four to six weeks behind on deliveries of bars and some finishes of sheets, and the size of their obligations is influencing their attitude on prices.

A test of the market was not expected so soon after the close of a quarter, but an encouraging volume of business has already been placed at fourth quarter prices, which for black and galvanized sheets, bars, plates and shapes represent an advance of $2 a ton.

This fact points to a demand for steel that is based on actual consumption. While buyers, in some cases, have been rebuilding their stocks, there has been no evidence of speculative purchases. The flow of business this year has been even steadier than in 1927. The decline from the peak rate of output in April to the low point in June was only 17 per cent, compared with a 30 per cent dip last year.

Pressure on the mills for steel has resulted in the lighting of additional blast furnaces. Out of 17 stacks blown in during September, 10 were started in the last week of the month. The net gain in active furnaces was 14, of which nine were steel works units. Such an increase may indicate a further expansion in steel output in October, which in the past has frequently been the premier month in production in the second half of the year. Heavier pig iron output may be dictated also by the growing scarcity of scrap.

An increasing quantity of scrap is being shipped out of the country, and a considerable amount is being diverted to new domestic markets. Exports of scrap in August, at 70,500 tons, were the largest on record, representing nearly one-fourth of our total outward movement of iron and steel. Shipments of scrap from Detroit, one of our largest producing centers, are moving more largely by water to Lake Erie ports instead of by rail, as formerly, to the Valleys. Lake shipments so far this season to one Buffalo consumer alone total 200,000 tons.

A direct result of the diversion of Detroit district scrap is an advance of 75c. a ton on basic pig iron in the Valleys. An inquiry for 12,000 tons of that grade found producers uninterested because they expect to consume all that they can make.

Meanwhile heavy melting scrap has advanced 25c. a ton at Pittsburgh and Chicago, and 50c. at Philadelphia. Prices at Pittsburgh are the highest since January, 1927.

Among the consuming industries, the railroads are taking a more prominent role. The Detroit, Toledo & Ironton has placed 12,500 tons of rails, and purchases by the New York Central and the Pennsylvania are expected next week. The Canadian National is inquiring for 15,000 tons. The rail buying movement, it is believed, will result in fully as large bookings as that of a year ago.

The Louisville & Nashville plans to purchase 2000 cars, and the Santa Fe is a prospective buyer of equipment. The Canadian National has ordered 55 locomotives, and is inquiring for five additional engines and 1500 box cars, besides tank and passenger cars.

Prospective construction work likely to be placed in the fourth quarter calls for 425,000 tons of structural steel, not including projects of less than 1000 tons each. Mill bookings of structural shapes in September were the largest of any month this year.

The buoyancy of consumption is indicated by the continued pressure for shipments, following heavy deliveries in the third quarter. Shipments by Chicago mills in that period were 15 per cent larger than in the preceding quarter. Steel ingot production at Chicago is now slightly over 85 per cent, which continues to be the average rate of the Pittsburgh district, as well as the Steel Corporation subsidiaries. Sheet production is particularly high, exceeding 90 per cent of the capacity of the country.

Pig iron production in September, according to data collected by THE IRON AGE, was 3,062,314 tons, compared with 3,136,570 tons in August. The average output per day, however, showed an increase, although it was less than 1 per cent. Nevertheless, with the blowing in of furnaces toward the end of the month, the daily capacity of stacks in blast Oct. 1 was 106,755 tons, against 98,730 tons Sept. 1.

This sharp gain appears warranted, in part, by the record of nine months' production. The steel ingot tonnage so far this year will prove to be some 10 per cent greater than that of the corresponding period of 1927, while the pig iron output is 1 per cent less, comparing the same periods. In both 1926 and 1927, for every 100 tons of steel made 83 tons of pig iron was produced. So far in 1928 the ratio is 100 to 75.

Both of THE IRON AGE composite prices have advanced, that for pig iron reaching $17.84 a gross ton, the highest figure since the end of October, 1927. The finished steel composite is 2.362c. a lb., compared with 2.348c. in the previous eight weeks.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pige Iron, Per Gross Ton:	Oct. 2, 1928	Sept. 25, 1928	Sept. 4, 1928	Oct. 4, 1927
No. 2 foundry, Philadelphia	$20.76	$20.76	$20.26	$20.26
No. 2, Valley furnace	17.00	17.00	16.50	17.50
No. 2, Southern, Cin'ti	19.94	19.94	19.94	20.94
No. 2, Birmingham	16.25	16.25	16.25	17.25
No. 2 foundry, Chicago*	18.50	18.50	18.00	19.50
Basic, del'd eastern Pa.	19.00	19.00	19.00	20.00
Basic, Valley furnace	**17.00**	16.25	16.00	17.00
Valley Bessemer, del'd P'gh	19.01	19.01	18.76	19.76
Malleable, Chicago*	18.50	18.50	18.00	19.50
Malleable, Valley	17.25	17.25	17.00	17.50
Gray forge, Pittsburgh	18.26	18.26	18.01	18.76
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	105.00	105.00	105.00	90.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh	32.00	32.00	32.00	33.00
O.-h. billets, Pittsburgh	32.00	32.00	32.00	33.00
O.-h. sheet bars, P'gh	32.00	32.00	32.00	34.00
Forging billets, P'gh	38.00	38.00	38.00	39.00
O.-h. billets, Phila	37.30	37.30	37.30	38.30
Wire rods, Pittsburgh	42.00	42.00	42.00	43.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.90	1.90	1.90	1.75
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.12	2.12	2.12	2.07
Iron bars, Chicago	2.00	2.00	2.00	1.90
Steel bars, Pittsburgh	1.90	1.90	1.90	1.75
Steel bars, Chicago	2.09	2.00	2.00	1.85
Steel bars, New York	2.24	2.24	2.24	2.09
Tank plates, Pittsburgh	1.90	1.90	1.90	1.75
Tank plates, Chicago	2.00	2.00	2.00	1.85
Tank plates, New York	**2.22½**	2.17½	2.17½	2.09
Beams, Pittsburgh	1.90	1.90	1.90	1.75
Beams, Chicago	2.00	2.00	2.00	1.85
Beams, New York	**2.19½**	2.14½	2.14½	2.09
Steel hoops, Pittsburgh	2.20	2.20	2.20	2.30

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Oct. 2, 1928	Sept. 25, 1928	Sept. 4, 1928	Oct. 4, 1927
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	**2.75**	2.65	2.65	3.00
Sheets, black, No. 24, Chicago dist. mill	2.75	2.75	2.75	3.10
Sheets, galv., No. 24, P'gh	**3.50**	3.40	3.40	3.85
Sheets, galv. No. 24, Chicago dist. mill	3.60	3.60	3.60	3.95
Sheets, blue, 9 & 10, P'gh	2.00	2.00	2.00	2.15
Sheets, blue, 9 & 10, Chicago dist. mill	2.10	2.10	2.10	2.35
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55
Wire nails, Chicago dist. mill	2.60	2.60	2.60	2.60
Plain wire, Pittsburgh	2.40	2.40	2.40	2.40
Plain wire, Chicago dist. mill	2.45	2.45	2.45	2.45
Barbed wire, galv., P'gh	3.20	3.20	3.20	3.25
Barbed wire, galv., Chicago dist. mill	3.25	3.25	3.25	3.30
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.50
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	**$17.00**	$16.75	$16.00	$15.00
Heavy melting steel, Phila	**16.00**	15.50	13.00	14.00
Heavy melting steel, Ch'go	**13.25**	13.00	12.75	12.00
Carwheels, Chicago	**13.75**	13.50	12.75	13.75
Carwheels, Philadelphia	16.50	16.50	15.50	15.50
No. 1 cast, Pittsburgh	15.00	15.00	14.75	14.75
No. 1 cast, Philadelphia	17.00	17.00	15.50	16.50
No. 1 cast, Ch'go (net ton)	15.00	15.00	14.25	14.50
No. 1 RR. wrot., Phila	15.50	15.50	13.50	15.50
No. 1 RR. wrot., Ch'go (net)	12.00	12.00	11.25	10.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.75	$2.75	$2.75	$2.85
Foundry coke, prompt	3.75	3.75	3.75	4.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	15.25	15.25	14.75	13.25
Electrolytic copper, refinery	15.00	15.00	14.50	13.00
Zinc, St. Louis	6.25	6.25	6.25	6.00
Zinc, New York	6.60	6.60	6.60	6.35
Lead, St. Louis	6.32½	6.32½	6.22½	6.00
Lead, New York	6.50	6.50	6.40	6.25
Tin (Straits), New York	**49.75**	48.62½	48.00	59.50
Antimony (Asiatic), N. Y.	**11.50**	11.00	10.12½	11.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Steel Industry Starts Fourth Quarter With Large Supply of Orders—Basic Pig Iron Advances 75c.

PITTSBURGH, Oct. 2.—The final quarter of the year starts with the steel industry very well supplied with orders—the result of the September rush of specifications on third quarter contracts and the fact that in a number of products buyers were able to get mills to take additional business for immediate specification, but for shipment at mill convenience. Steel makers are well satisfied with the business side of the picture, and, while they have not succeeded in lifting prices on fourth quarter contracts as high as they desired, some advance has been obtained.

Steel works operations still are strong and at fully 85 per cent of capacity, and blast furnace operations are higher than they have been, four local steel works stacks having been blown in recently.

The undertone of the steel market is stronger, and there is a confident feeling among steel manufacturers. Some are beginning to believe that the consumption of steel is closer to what might be termed easy running capacity than has been supposed. That the flow of business has been steadier so far this year than it was last year is indicated by the fact that the fluctuation in the rate of ingot production from the high point in April and the low point in June was slightly less than 17 per cent, against a 30 per cent variation in the first eight months of last year.

While lately there has been some evidence that consumers were rebuilding their stocks, there is no sign that any of the buying recently or over the year to date has been at all speculative.

Primary materials attract attention this week, with something of a "pinch" in basic iron, the price of which has risen very sharply in the anxiety of consumers to secure supplies. The scarcity of scrap enters into the basic iron situation, as a diversion of scrap from its former channels, due to water-borne movements from Detroit to Eastern steel producing centers, is the primary reason for one large inquiry for basic iron. Heavy melting steel has moved to solid ground at $17, under fresh mill buying and the fact that a shortage still exists.

Pig Iron.—Inquiries for basic iron totaling more than 20,000 tons have developed that there is very little of this grade for sale, and, in the anxiety of consumers to secure some, the price has risen sharply. As much as $17, Valley furnace, has been obtained for approximately 2200 tons, or 75c. a ton advance over the nominal minimum price of a week ago. Smaller lots also have been moved at that price, and, while one sale of between 2000 and 3000 tons is noted at $16, Valley furnace basis, it developed that the iron was below standard grade and the price obtained for it was fully 75c. a ton above that at which it was offered several weeks ago. Moreover, a Youngstown steel company reports having been obliged to refuse an order for about 12,000 tons, not because of an unsatisfactory bid, but because the prospect is that this maker will not have any surplus basic iron during the remainder of the year. It is not believed that yard supplies of this grade are exhausted, but the high rate of steel works engagement, to say

nothing of a marked scarcity of steel works grades of scrap and the consequent higher melt of pig iron, has given this kind of iron a value it did not recently have. Those who have supplies are not disposed to sell and those who are short of scrap want iron badly. This combination of circumstances usually produces just such a situation as the existing one. An Ohio steel company, which has not been able to get as much scrap as formerly on account of the diversion of Detroit supplies by water to Cleveland and Buffalo, has bought some iron against an inquiry totaling 15,000 tons. A few weeks ago it bought that amount from a Cleveland steel maker. Several other melters also are in the market for good-sized blocks. Two of the inquiries originated from Valley steel companies, which shortly will put out their own furnaces for repairs and relining and are anxious to accumulate reserve supplies. The strength of basic iron is individual, as prices of other grades have not been affected except sentimentally, and this is seen in higher asking prices rather than in actual sales prices. Foundry iron remains at $17, Valley furnace, for the base grade, and the business of the week does not warrant a change in malleable and Bessemer grades. The Carnegie Steel Co. has put on one Clairton furnace, but will take one of that group off in the next week or 10 days. One of its Carrie furnaces also has resumed. The Pittsburgh Steel Co. and the Pittsburgh Crucible Steel Co. each has put on a furnace lately, and the Sharpsville furnace of the Davison Coke & Iron Co. was blown in Oct. 1. W. P. Snyder & Co. make the average price of Valley basic and Bessemer iron for September $16.50 and $17.20.

Prices per gross ton. f.o.b. Valley furnace:

Basic	$17.00
Bessemer	$17.25 to 17.50
Gray forge	16.50
No. 2 foundry	17.00
No. 3 foundry	16.50
Malleable	17.25 to 17.50
Low phos., copper free	26.50

Freight rate to Pittsburgh or Cleveland district, $1.76.

Semi-Finished Steel.—Fourth quarter prices for billets, slabs and sheet bars are not yet fully established. While several mills have announced a basis of $34, Pittsburgh, for 4-in. billets and equivalent area of slabs, with an extra of $1 a ton for smaller sizes down to 1½ x 1½ in., there has been very little contracting to date, as the principal buyers—non-integrated strip manufacturers—have accumulated a considerable stock and seem disposed to use up these supplies before making fresh purchases. There is additional reason for delay in the fact that fourth quarter contracts for strip steel carry practically the same prices as those for the second and third quarters. Almost all makers of sheet bars have announced $33, Pittsburgh, as the fourth quarter contract price, but acceptance by one or two makers of business for this period at the third quarter price indicates a range of quotations of $32 to $33. Forging quality billets for this quarter have been entered at $38 by some makers, but others want $39 and $40, figuring an extra of $5 or $6 a ton over a base price of $34 for rerolling billets. The new chemical extras are being applied and the need for a separate quotation for guaranteed analysis steel is thereby obviated. Wire rods are steady at $42, base Pittsburgh and Cleveland. Mills have quite generally moved to a minimum of 1.90c. on pipe skelp; demand is only moderately active.

Bars, Plates and Shapes.—Makers in this territory start the final quarter of the year with a minimum price of 1.90c., base, on these products, and insist that this is the large-lot price, with buyers taking smaller tonnages paying $1 or $2 a ton more. In a general way, however, 1.90c. and 1.95c. are the prevailing prices, with 2c., base, being obtained only from very small buyers or for tonnages that are unattractive from a mill viewpoint. It is early for much specifying on fourth quarter contracts, because there are few buyers who have exhausted steel ordered on third quarter commitments. Demand for bars is heavy, and promptness of deliveries, to which buyers have long been accustomed, is not possible because almost all makers have three to four weeks' business scheduled. Structural shapes are moving well, but real activity is lacking in plates. Fabricated steel inquiry is reported good, and a feature is the large number of factory buildings in the pending business.

Rails and Track Supplies.—Current business is moderate in rails and track accessories, light-section rails and small spikes finding only a limited demand, but the annual rail buying movement has opened and the mills are expecting soon to have sufficient business to give standard-section rail mills full engagement throughout the winter.

Wire Products.—There is not much activity in nails, but other wire products appear to be moving steadily. Prices are well maintained, but reports that an advance was under consideration find no verification.

Tubular Goods.—The demand continues strong for seamless pipe for deep oil well drilling, and most makers are well supplied with pipe line business. In other directions, business is only moderately active, lapwelded oil country pipe being really slow, since there is not much drilling at present in the shallow well fields.

Sheets.—The interesting feature of the situation is the stronger price stand that most makers now are taking. Full order books have placed producers in an independent position, with respect both to prices and deliveries. It is no longer possible for buyers to place orders on a basis of deliveries to start within a week, as has been the case most of the year, and there are instances where the best promise is from three to four weeks. Price shading has not entirely disappeared, but on new business the mills generally are holding firmly to 2.75c., base, for black, 3.50c., base, for galvanized and 2c., base, for blue annealed. There still is some opposition to the lower rate of discount for cash, which became effective Oct. 1, but no evidence that the mills are yielding. A high rate of consumption is indicated by the fact that more than 90 per cent of the country's sheet making capacity is in operation.

The Iron Age Composite Prices

Finished Steel

Oct. 2, 1928, 2.362c. a Lb.

One week ago	2.348c.
One month ago	2.348c.
One year ago	2.346c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1928	2.364c.,	Feb. 14;	2.314c.,	Jan. 3
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	Apr. 24;	2.446c.,	Jan. 2

Pig Iron

Oct. 2, 1928, $17.84 a Gross Ton

One week ago	$17.71
One month ago	17.34
One year ago	18.09
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1928	$17.84,	Oct. 2;	$17.04,	July 24
1927	19.71,	Jan. 4;	17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	Mar. 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mill	1.90c. to 2.00c.
F.o.b. Chicago	2.00c. to 2.10c.
Del'd Philadelphia	2.22c. to 2.32c.
Del'd New York	2.24c. to 2.34c.
Del'd Cleveland	1.92½c. to 2.05c.
F.o.b. Cleveland	1.90c. to 2.05c.
F.o.b. Lackawanna	2.00c. to 2.10c.
F.o.b. Birmingham	2.15c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills, 40, 50 and 60-ft. lengths	2.00c.
F.o.b. Pittsburgh mills, cut lengths	2.25c.
F.o.b. Birmingham	2.15c.

Rail Steel

F.o.b. mills east of Chicago dist.	1.85c.
F.o.b. Chicago Heights mill	1.95c.

Iron

Common iron, f.o.b. Chicago	2.00c. to 2.10c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mills	1.90c. to 2.00c.
F.o.b. Chicago	2.00c. to 2.10c.
F.o.b. Birmingham	2.15c.
Del'd Cleveland	2.04c. to 2.09c.
Del'd Philadelphia	2.15c. to 2.25c.
F.o.b. Coatesville	2.05c. to 2.15c.
F.o.b. Sparrows Point	2.05c. to 2.15c.
F.o.b. Lackawanna	2.00c. to 2.10c.
Del'd New York	2.22½c. to 2.32½c.
C.i.f. Pacific ports	2.20c. to 2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.90c. to 2.00c.
F.o.b. Chicago	2.00c. to 2.10c.
F.o.b. Birmingham	2.15c.
F.o.b. Lackawanna	2.00c. to 2.10c.
F.o.b. Bethlehem	2.05c. to 2.15c.
Del'd Cleveland	2.04c. to 2.09c.
Del'd Philadelphia	2.11c. to 2.21c.
Del'd New York	2.19½c. to 2.29½c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
Narrower than 3 in., P'gh	2.10c. to 2.20c.
From 3 in. to 6 in., P'gh	1.85c. to 2.00c.
6 in. and wider, P'gh	*1.75c. to 1.90c.
Narrower than 3 in., Chicago	2.30c.
From 3 to 6 in., Chicago	2.20c.
6 in. and wider, Chicago	2.00c.
Cotton ties, f.o.b. Atlantic and Gulf ports:	
Carload per 45-lb. bundle	$1.27
2000 bundle lots	1.25
Larger lots	1.23

*Mills follow plate or sheet prices according to gage on wider than 12 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mill	2.10c. to 2.20c.
Bars, f.o.b. Chicago	2.20c.
Bars, Cleveland	2.15c. to 2.25c.
Shafting, ground, f.o.b. mill	*2.55c. to 3.50c.
Strips, P'gh	2.75c. to 2.85c.
Strips, Cleveland	2.75c. to 2.85c.
Strips, del'd Chicago	3.05c. to 3.15c.
Strips, Worcester	2.90c. to 3.00c.
Fender stock, Pittsburgh	4.25c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.55
Galvanized nails	4.55
Galvanized staples	3.25
Polished staples	3.00
Cement coated nails	2.55

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.40
Annealed fence wire	2.55
Spring wire	3.40
Galv'd wire, No. 9	3.00
Barbed wire, galv'd	3.20
Barbed wire, painted	2.95

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester Mass., (wire) mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton nigher; Anderson, Ind., $1 higher.

Woven Wire Fence

Base to Retailers Per Net Ton

F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. P'gh	2.00c. to 2.10c.
Nos. 9 and 10, f.o.b. Chicago dist.	2.10c. to 2.20c.
Nos. 9 and 10, del'd Cleveland	2.09c. to 2.19c.
Nos. 9 and 10, del'd Philadelphia	2.32c. to 2.42c.
Nos. 9 and 10, f.o.b. Birmingham	2.15c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.75c. to 2.85c.
No. 24, f.o.b. Chicago dist. mill	2.75c. to 2.85c.
No. 24, del'd Cleveland	2.94c.
No. 24, del'd Philadelphia	3.07c. to 3.17c.
No. 24, f.o.b. Birmingham	2.90c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	3.85c. to 3.90c.
No. 24, f.o.b. Pittsburgh, B grade	3.65c. to 3.70c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.50c. to 3.60c.
No. 24, f.o.b. Chicago dist. mill	3.60c. to 3.70c.
No. 24, del'd Cleveland	3.59c. to 3.69c.
No. 24, del'd Philadelphia	3.82c. to 3.92c.
No. 24, f.o.b. Birmingham	3.65c. to 3.70c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.90c.
No. 28, f.o.b. Chicago dist. mill	3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.00c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill primes	4.10c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.25
Standard cokes, f.o.b. Gary	5.35

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)

(Per Package, 20 x 28 in.)

8-lb. coating I.C. $11.20	25-lb. coating I.C. $16.70
15-lb. coating I.C. 14.00	30-lb. coating I.C. 17.75
20-lb. coating I.C. 15.30	40-lb. coating I.C. 19.85

Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quality Bar Base, 2.75c.

S.A.E. Series Numbers		Alloy Differential	Net Price 100 Lb. Bars
2000	(1¼% Nickel)	$0.25	$3.00
2100	(1¼% Nickel)	0.55	3.30
2300	(3½% Nickel)	1.50	4.25
2500	(5% Nickel)	2.25	5.00
3100	Nickel Chromium	0.55	3.30
3200	Nickel Chromium	1.35	4.10
3300	Nickel Chromium	3.80	6.55
3400	Nickel Chromium	3.20	5.95
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50	3.25
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70	3.45
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05	3.80
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35	3.10
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45	3.20
5100	Chromium Spring Steel	0.20	2.95
6100	Chromium Vanadium Bars	1.20	3.95
6100	Chromium Vanadium Spring Steel	0.95	3.70
9250	Silicon Manganese Spring Steel	0.25	3.00
	Chromium Nickel Vanadium	1.50	4.25
	Carbon Vanadium	0.95	3.70

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 down to and including 2½ in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a $5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price.

Band sizes are 40c. per 100 lb. higher.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base Per 100 Lb.
Spikes, ⅜ in. and larger	$2.80
Spikes, ½ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plates, steel	2.15
Angle bars	2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	42½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	28	12
¾	58	47½	1 to 1½	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than **the above discounts**. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 4½ in.	46	3¼ to 4½ in.	— 9
5 to 6 in.	40		

Beyond the above base discounts, the following extra discounts are given:

Lap Weld Steel		Charcoal Iron
Under 5000 lb.	4 Fives	1 Ten
5000 lb. to 12,000 lb.	5 Fives	2 Tens
12,000 lb. to 21,000 lb.	6 Fives	2 Tens & 2½
21,000 lb. and over	7 Fives	2 Tens & 5

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	63	3 in.	48
1¼ to 1½ in.	55	3¼ to 3½ in.	50
1¾ in.	39	4 in.	53
2 to 2¼ in.	34	4½, 5 and 6 in.	45
2½ to 2¾ in.	42		

Hot Rolled

2 and 2¼ in.	40	3¼ to 3½ in.	56
2½ and 2¾ in.	48	4 in.	59
3 in.	54	4½, 5 and 6 in.	48

Less carload, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base (carloads)	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

Tin Plate.—The seasonal slump in demand and in mill operations is slighter than usual, owing to a good demand for general line tin plate and some export demands of fair size, which partly offset the loss of packers' can business. The general average of tin mill engagement is about 75 per cent of capacity, though some producers are running at a higher rate.

Cold-Finished Steel Bars and Shafting.—Makers now report free acceptance on the part of consumers of the $2 a ton advance in prices on fourth quarter contracts. Little tonnage yet is moving at 2.20c., base, because third quarter contracts did not contain a clause making it necessary to have specifications in before the quarter ended. In fourth quarter contracts there is a stipulation that specifications must be in by Dec. 10.

Boiler Tubes.—Leading makers of welded steel boiler tubes have made a slight revision in prices of the larger sizes, effective Oct. 1. Heretofore, the card discount on sizes 4 in. to 14 in. has been 46 per cent; under the new method of quoting, sizes greater than 6 in. in diameter are discontinued and the old discount of 46 per cent applies to 4-in. to 4½-in. tubes, while for 5-in. to 6-in. tubes, a new discount of 40 per cent has been named. Roughly, this means an advance of $12 a ton on the larger sizes, one point in the discount being approximately $2 a ton. Supplementary discounts are the same as they have been for several months.

Hot-Rolled Flats.—September was a heavy month in strip specifications, and makers have order books sufficient to keep them busy most of this month. A recession in buying is expected this month, as it is believed that November automobile production will fall somewhat from the present rate. Prices are steady.

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24), 25 or more bundles	3.45c.
Galv. sheets (No. 24), 25 or more bundles	4.30c.
Blue ann'l'd sheets (No. 10), 1 to 10 sheets	3.35c.
Galv. corrug. sheets (No. 28), per square	$4.31
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 per cent off list
Machine bolts, 100 count,	60 per cent off list
Carriage bolts, 100 count,	60 per cent off list
Nuts, all styles, 100 count,	60 per cent off list
Large rivets, base per 100 lb.	$3.50
Wire, black soft ann'l'd, base per 100 lb.	$3.00 to 3.10
Wire, galv. soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Old Material.—The market has developed a fresh burst of strength in the steel works grades, chiefly as a result of a purchase by the Steel Corporation for one of its Pittsburgh district plants of about 20,000 tons of heavy melting steel at $17. This sale seems to have established that grade at that price. No higher price has been obtained, but dealers seem unable to buy for any lower figure. The market also is stronger on compressed sheets, which have sold at as high as $17. The events of the week have given a generally stronger tone to the entire market. Machine shop turnings are not salable at more than $11.50, as the principal user, after buying at that price, withdrew from the market, and dealers with short orders do not appear willing to go above $11 to cover. One mill in the district still is holding up shipments on orders, but the sustained rate of steel works operations is keeping up the demand for shipments generally, and dealers are finding it hard to cover their short sales. The October scrap list of the Baltimore & Ohio Railroad, which closes Oct. 8, contains 9575 gross tons.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
Heavy melting steel	$17.00
Scrap rails	$16.50 to 17.00
Compressed sheet steel	16.50 to 17.00
Bundled sheets, sides and ends	15.00 to 15.50
Cast iron carwheels	15.25 to 15.75
Sheet bar crops, ordinary	17.00 to 17.50
Heavy breakable cast	12.75 to 13.25
No. 2 railroad wrought	17.00 to 17.50
Heavy steel axle turnings	15.00 to 15.50
Machine shop turnings	11.00 to 11.50
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	17.50 to 18.00
Railr. coil and leaf springs	17.50 to 18.00
Rolled steel wheels	17.50 to 18.00
Low phos. billet and bloom ends	20.00 to 20.50
Low phos., mill plates	18.50 to 19.00
Low phos., light grade	17.50 to 18.00
Low phos., sheet bar crops	18.50 to 19.00
Hvy. steel axle turnings	15.00 to 15.50
Electric Furnace Grades:	
Low phos. punchings	17.50 to 18.00
Hvy. steel axle turnings	15.00 to 15.50
Blast Furnace Grades:	
Short shoveling steel turnings	12.50 to 12.75
Short mixed borings and turnings	12.50 to 12.75
Cast iron borings	12.50 to 12.75
No. 2 busheling	11.25 to 11.75
Rolling Mill Grades:	
Steel car axles	18.50 to 19.50
No. 1 railroad wrought	12.50 to 13.00
Sheet bar crops	18.00 to 18.50
Cupola Grades:	
No. 1 cast	15.25 to 15.75
Rails 3 ft. and under	17.50 to 18.00

Cold-Rolled Strips.—All makers in this area are well supplied with business as a result of heavy September specifications. Average prices for the final quarter of the year will be higher than in the past two quarters, since producers were able to secure a slight advance from the large users.

Bolts, Nuts and Rivets.—Signed fourth quarter contracts are coming in well, and makers expect heavier specifications than in the past two quarters owing to the prospect of increased railroad demands. Prices are holding well. Most makers of rivets are observing $2.90, base, per 100 lb. on large sizes and 70 to 70 and 10 per cent discount for small rivets.

Coke and Coal.—The spot coke market still is very firm, but not quotably higher than in the past few weeks. The coal market is featured by a stronger situation in household grades, but the production of these grades means an excessive supply of slack, which is selling at very low prices.

Increased Rail Shipments This Quarter Forecast

WASHINGTON, Oct. 2.—Estimates of an increase of 7.3 per cent in carload shipments of iron and steel during the last quarter of the current year as against the corresponding period of 1927 have been made by the 13 Shippers' Regional Advisory Boards, according to the American Railway Association. The estimated carload shipments of iron and steel during October, November and December of the present year are 388,280, compared with 361,805 for the fourth quarter of last year. Other commodities included in the 29 which are expected to show increased shipments are coal and coke; ore and concentrates; castings, machinery and boilers; agricultural implements and vehicles, other than automobiles, and automobiles. The carload shipments of the 29 commodities estimated for the last quarter of 1928 are approximately 9,279,472 cars, an increase of 4.9 per cent or 431,599 cars.

Included in the estimated increases are the following:

(In Carloads)

	Actual, 1927	Est., 1928	Per Cent Inc.
Iron and steel	361,805	388,280	7.3
Coal and coke	3,033,956	3,157,032	4.1
Ore and concentrates	352,274	385,731	9.5
Castings, machinery and boilers	55,516	58,569	5.5
Agricultural implements and vehicles, other than automobiles	30,620	32,825	7.2
Automobiles, trucks and parts	152,150	197,116	29.6

The thirty-fourth annual meeting of the Ohio Valley Improvement Association at the William Penn Hotel, Pittsburgh, opened Tuesday evening, Oct. 2, with a banquet, at which there was not only a full attendance of the membership of the association, but a large representation of steel company executives interested in the development of the inland waterways for the shipment of their products. On Wednesday, the Jones & Laughlin Steel Corporation entertained the delegates at luncheon at the Chartiers Heights Country Club. Today (Thursday) visitors will be guests of the Carnegie Steel Co. on an inspection trip on the Monongahela River.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$32.00 to $34.00
Rerolling, under 4-in. to and including 1¾-in.	33.00 to 35.00
Forging	38.00 to 40.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$32.00 to $33.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$32.00 to $34.00
Smaller than 8 in. x 2 in.	33.00 to 35.00

Skelp

	Per Lb.
Grooved	1.90c. to 2.00c.
Sheared	1.90c. to 2.00c.
Universal	1.90c. to 2.00c.

Wire Rods

	Per Gross Ton
*Common soft, base	$42.00
Screw stock	$5.00 per ton over base

*Chicago mill base is $43. Cleveland mill base, $42.

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian	10.00c.
Iron ore, Swedish, average 66% iron,	9.25c. to 9.50c.
Manganese ore, washed, 52% manganese, from the Caucasus	38c.
Manganese ore, Brazilian, African or Indian, basic 50%	37c. to 38c.
Tungsten ore, high grade, per unit, in 60% concentrates	$10.90 to $11.25

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.75
Foundry, f.o.b. Connellsville prompt	$3.50 to 4.25
Foundry, by-product, Ch'go ovens	8.00
Foundry, by-product, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, Birmingham	5.00
Foundry, by-products, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.80
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in., f.o.b. Pa. mines	2.00 to 2.10
Mine run gas coal, f.o.b. Pa. mines	1.75 to 1.90
Steam slack, f.o.b. W. Pa. mines	80c. to 90c.
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.20

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$105.00
Foreign, 80%, Atlantic or Gulf port, duty paid	105.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$33.00
Domestic, 16 to 19%	32.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50 to $88.50
75%	130.00 to 140.00

	Per Gross Ton Furnace		Per Gross Ton Furnace
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
10%	$30.00	12%	$34.00
11%	32.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
6%	$23.00	10%	$28.00
7%	24.00	11%	30.00
8%	25.00	12%	32.00
9%	26.00		

Other Ferroalloys

Ferrotungsten, per lb., contained metal del'd ..... 95c. to 98c.
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads ..... 11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace ..... $3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads $200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton $91.00
Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton $122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium, fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$17.00
No. 2 lump, Illinois and Kentucky mines	$18.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	———
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Standard size	45.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages, Pittsburgh	80, 10 and 2½
Stove bolts in packages, Chicago	75, 20, 10 and 5
Stove bolts in bulk, Pittsburgh	80, 10 and 5
Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base Per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago	70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened	80 and 10
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U.S.S. thread	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

Steel Industry Now on Unusually Stable Basis—Backlogs Have Expanded—Price Situation Stronger

CHICAGO, Oct. 2.—The opening of the final quarter finds the steel business on an unusually stable basis. Forward contracting, which had lagged up to the last days of September, suddenly became active. Backlogs have expanded rapidly. Sales in the week brought the total for September well above the aggregate in August. Both specifications and shipments gradually expanded throughout September, so that deliveries in the third quarter exceeded by not less than 15 per cent the shipments in the second three months of this year. Specifications in the last week compare favorably with the best week so far this year, though at present it is notable that car tonnage is small and rail releases are not yet an important factor.

Prices for plates, shapes and bars are showing greater strength at 2c. to 2.10c. per lb., Chicago. Heavy purchases in the last few days indicate that buyers' resistance is lessening.

Deliveries, except in structural material, are being crowded further into the future. Shipments on most sizes of bars are now about five weeks.

Ingot output is a shade higher at 85 per cent of capacity. Pressure by purchasers for best possible deliveries and the tendency for users to plan schedules further in advance reflect the higher speed of industry and lay at rest the fear expressed by some that the fall steel market was becoming speculative and that users were building stocks beyond immediate requirements. In some instances consumers have been forced to carry larger stocks because delayed deliveries have made it necessary to keep on hand a more comfortable margin of steel.

Pig Iron.—The center of interest in this market lies in the accelerated rate of shipments. The melt in local and nearby foundries is expanding and insistence on prompt deliveries is more common. Malleable foundries producing a larger portion of light than of heavy castings are operating at close to capacity. Miscellaneous sales of charcoal iron are numerous, the aggregate of all orders being close to 1000 tons. Prices of this grade are steady at $24, furnace. A local steel mill furnace that of late has been giving trouble and which may go down for repairs is producing some iron that is being offered through brokers.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$18.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	19.00
Malleable, not over 2.25 sil	18.50
High phosphorus	18.50
Lake Super. charcoal, sil. 1.50	27.04
So'th'n No. 2 fdy. (all rail)	22.26
Low phos., sil. 1. to 2., copper free	$28.50 to 29.00
Silvery, sil. 8 per cent	29.79
Bess. ferrosilicon, 14-15%	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys. — Several carloads of spiegeleisen have been placed at $33, Hazard, Pa. It is reported that a direct shipment of this commodity is now on the water bound from England to Chicago. Prices for ferromanganese are strong at $105, seaboard.

Prices delivered Chicago: 80 per cent ferromanganese, $112.56; 50 per cent ferrosilicon, $83.50 to $87.50; spiegeleisen, 19 to 21 per cent, $40.76.

Plates.—Specifications for plates continue to come from a wide variety of users and in a large aggregate tonnage. Car shops are operating at low capacity, but tank makers and fabricators of pipe from plates are busy. Closer control of oil well output is checking orders for tanks. One lot of 8000 tons for this purpose is still before the trade. Prices are steady at 2c. to 2.10c. per lb., Chicago.

Mill prices on plates, per lb.: 2c. to 2.10c. base Chicago.

Bars.—Soft steel bar mills in the Chicago district are operating within a point or two of capacity. Specifications have been unusually liberal this week, and deliveries for most sizes have been extended to five weeks, though some sizes can still be delivered in three weeks. Heavy releases have recently been made by drop forgers, while makers of cold-drawn bars are in need of larger quantities. From the viewpoint of Chicago producers of steel, there has been no letdown in the automobile industry as a whole. Ford is reported to have reached an output of 5300 cars a day. Current orders for rail steel bars are numerous at 1.95c. per lb., Chicago Heights. Specifications from barn equipment makers are smaller, but the bed industry is busier. Deliveries range from two to three weeks. Producers are asking $1 to $2 a ton more for iron bars. New buying is sluggish and specifications are small. Prices for alloy steel bars are firm, and specifications are steady. Fourth quarter contracts are about equal in tonnage to third quarter commitments.

Mill prices per lb.: Soft steel bars, 2c. to 2.10c., base, Chicago; common bar iron, 2c. to 2.10c., base, Chicago; rail steel bars, 1.95c., base, Chicago Heights mill.

Structural Material. — Orders for structural material total 6600 tons for the week. The bulk of this is for bridge work. The Great Northern has ordered 1900 tons, and a bridge at Grand Forks, N. D., takes 1200 tons. The American Bridge Co. will supply 2800 tons for a garage in Chicago. Fresh inquiries include 6000 tons for miscellaneous bridge work. Competition among fabricators is keener, especially for large jobs. Demand for structural material is the lightest of the heavy tonnage steel products.

Mill prices on plain material, per lb.: 2c. to 2.10c. base, Chicago.

Rails and Track Supplies.—Among fresh inquiries for standard-section rails this week is 15,000 tons for the Canadian National. Several large railroads are said to have their 1929 programs mapped out and will make definite inquiry before the middle of the month. Users have ordered a few carloads of light rails. Miscellaneous track accessory orders total 6000 tons. The 12,000 to 15,000 tons needed by the Chesapeake & Ohio is still before the trade, according to reports here. Releases against recent rail purchases are liberal. Output remains unchanged. The Chesapeake & Ohio rail order for 45,500 tons, mentioned last week, was distributed as follows: 19,380 tons each to the Illinois and Inland steel companies and 6740 tons to the Bethlehem Steel Co.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bess. rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.15c.; angle bars, 2.75c.

Cast Iron Pipe.—The Glamorgan Pipe & Foundry Co. bid $43 per ton, delivered, and the United States Cast Iron Pipe & Foundry Co. quoted $44 on 2120 tons of 6, 8 and 12-in. pipe for Chicago. The freight rate from Birmingham to Chicago is $8.20, bringing the low bid to $32.08, Birmingham. On small tonnages, sellers are readily obtaining $35 a ton, Birmingham, for 6-in. and larger diameters, and in several instances $37 has been obtained. Though prices have not definitely risen to higher levels, dealers appear to be anxious to put in effect advances for average sizes and small tonnages. Sales are few in number and inquiries are scarce. Railroads and public utilities have ordered a few carloads.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, $42.20 to $43.20; 4-in., $46.20 to $47.20; Class A and gas pipe, $4 extra.

Sheets.—Prices remain strong, and some observers feel that advances are near at hand. Mill backlogs are heavy. Spot sales are numerous and afford a real gage of present prices. Hot mills are engaged at close to capacity, and specifications have been in such volume that deliveries have been extended to a range of three to four weeks. Shipments to barrel and light tank manufacturers are large, and the roofing trade is busy, now being in the midst of a very active fall season.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.80c. to 2.90c.; No. 24 galv., 3.65c. to 3.75c.; No. 10 blue ann'l'd, 2.15c. to 2.25c. Deliv'd prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Bolts, Nuts and Rivets.—Specifications in September fell below the total in August, but consumers' stocks

seem now to have been reduced to a minimum, and, with greater industrial activity, there is a noticeable pickup in the total volume of releases against commitments. Agricultural implement manufacturers and the railroads are among those that are in need of larger quantities. Prices are steady.

Warehouse Business.—Effective Oct. 1, warehouses adopted a cash discount of one-half of 1 per cent on sheets and cold-rolled strip. Warehouses have dropped the extra of 10c. per 100 lb. on blue annealed sheets on gages No. 8 and No. 10 in widths of 40 in. and over.

Cold-Rolled Strip. — Business remains brisk at 2.75c. to 2.85c., base, per lb., Cleveland. Specifications are heavy and output is not far from the capacity of mills.

Old Material.—Heavy melting steel has moved up 25c. a ton and many other grades of scrap iron and steel are proportionately higher in price. For the most part, individual sales are smaller than might be expected with business as brisk as it is now, but buyers are moving cautiously and are not ready to admit that the market is as strong as pictured by dealers. This condition, however, has prevailed for several weeks, during which time the market has steadily moved upward. It is reported that brokers are paying as high as $14 a gross ton, delivered, for heavy melting steel to be shipped against old obligations. Likewise, in cast iron borings and rerolling rails, dealers are paying prices that are 25c. to 50c. above the quotations on heavy tonnage sales. A steel mill has bought a round tonnage of borings at $10.50 a gross ton, and late last week brokers were offering $10.25 to cover old orders taken at $10, delivered. Shipment of industrial scrap, especially from automobile manufacturing plants, is heavy. Foundries, including makers of malleable castings, are busy and their purchases of scrap are liberal, though for immediate requirements only. A broker is reported to have paid $17.75 a gross ton for rerolling rails. This is about 75c. above prices said to have been paid by users. The recovery of the local scrap market is clearly indicated by the fact that billings by brokers in September were larger than in any previous month this year. Among railroad offerings this week are 40,000 tons by the Pennsylvania and 6000 tons by the Chicago & North Western.

Prices deliv'd Chicago district consumers:

Per Gross Ton

Basic Open-Hearth Grades:	
Heavy melting steel	$13.25 to $13.75
Shoveling steel	13.25 to 13.75
Frogs, switches and guards, cut apart, and misc. rails	15.00 to 15.50
Hydraul. compressed sheets	11.75 to 12.25
Drop forge flashings	9.50 to 10.00
Forg'd, cast and r'l'd steel carwheels	17.00 to 17.50
Railr'd tires, charg. box size	17.00 to 17.50
Railr'd leaf spring cut apart	17.00 to 17.50
Acid Open-Hearth Grades:	
Steel couplers and knuckles	15.50 to 16.00
Coil springs	18.00 to 18.50
Electric Furnace Grades:	
Axle turnings	13.50 to 14.00
Low phos. punchings	15.50 to 16.00
Low phos. plate, 12 in. and under	15.50 to 16.00
Blast Furnace Grades:	
Axle turnings	11.00 to 11.50
Cast iron borings	10.25 to 10.75
Short shoveling turnings	10.25 to 10.75
Machine shop turnings	6.75 to 7.25
Rolling Mill Grades:	
Iron rails	14.75 to 15.25
Rerolling rails	16.50 to 17.00
Cupola Grades:	
Steel rails less than 3 ft.	17.00 to 17.50
Angle bars, steel	16.25 to 16.75
Cast iron carwheels	13.75 to 14.00
Malleable Grades:	
Railroad	15.00 to 15.50
Agricultural	12.50 to 13.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heav.	26.00 to 31.00

Per Net Ton

Rolling Mill Grades:	
Iron angles and splice bars	14.50 to 15.00
Iron arch bars and transoms	20.50 to 21.00
Iron car axles	25.50 to 26.00
Steel car axles	16.25 to 16.75
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.75 to 12.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	5.75 to 6.25
Locomotive tires, smooth	13.00 to 13.50
Pipes and flues	9.00 to 9.50
Cupola Grades:	
No. 1 machinery cast	15.00 to 15.50
No. 1 railroad cast	14.50 to 15.00
No. 1 agricultural cast	13.00 to 13.50
Stove plate	11.25 to 11.75
Grate bars	12.25 to 12.75
Brake shoes	11.25 to 11.75

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Wire Products.—The jobbing business gives no indication of the lively trade that producers had expected during the early weeks of fall. Added to dullness in the Central States and in the Northwest is a slowing down of fence business in the South The manufacturing trade, in contrast with business done with distributers, is unusually heavy, purchases in September having been larger than in any month this year. Fourth quarter contracting has moved rapidly in the last week, with the result that the bulk of requirements for the next three months has been covered. It is noticeable that estimates of future requirements are more conservative than in the last quarter. Shipments from mills balance well with production, which now stands at 65 per cent of capacity.

Reinforcing Bars.—Among awards this week is 600 tons of billet steel reinforcing bars for construction work at Stickney, Ill. Lettings are more numerous in sizes from 50 to 200 tons and dealers' order books are growing. Some shops are engaged at close to capacity, with the outlook favorable for steady output well through October. Contractors are rushing jobs that are under way and requests for prompt shipments are insistent. Prices again have turned to the weak side. Efforts to advance rail steel reinforcing bars $2 a ton are meeting with strong resistance. Billet steel bars out of Chicago warehouse have touched a new bottom at 2.15c. a lb. for lots of 100 tons and more. Quotations on smaller business are proportionately lower.

Coke.— Shipments of by-product foundry coke remain heavy, and prices are firm at $8 a ton, f.o.b. local ovens. All ovens in this district are lighted.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforc'g bars, billet steel	2.15c. to 2.50c.
Reinforc'g bars, rail steel	2.00c. to 2.50c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.80c.
Galv. sheets (No. 24)	4.65c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes, stand. railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, sq., tap. or blank	60
Hot-pressed nuts, hex., tap. or blank	60
No. 8 black ann'l'd wire, per 100 lb.	$3.30
Com. wire nails, base per keg	3.10
Cement c't'd nails, base per keg	3.10

Index to Wholesale Prices

Revised index numbers of wholesale prices, using 1926 as a basis of 100 and giving monthly figures for the principal groups of products and subgroups, from the beginning of 1913 to the middle of 1928, have been published by the United States Bureau of Labor Statistics. The pamphlet covers 32 pages of tables, with one introductory page. In extending these numbers back to 1913, allowance was made for variations in the importance of commodities as developed year by year.

The United States Treasury Department has filed a brief appealing the decision early this year by Justice Fischer, sitting in the Customs Court, that reinforcing bars should be classified as structural material taking a duty of 20c. per 100 lb. instead of as bars with a duty of 30c. per 100 lb. A brief has also been submitted to the Customs Court of Appeals by attorneys for the defendant in the litigation, Henry L. Exstein Co., 233 Broadway, New York, and a court hearing is expected some time next month.

The American Sheet & Tin Plate Co. has started on a program of betterments at its Vandergrift, Pa., works, the principal part of which is in expanding the annealing capacity of the plant and the addition of normalizing furnaces. An old warehouse is to be razed to provide space for the new furnaces. Annealing capacity has been inadequate at this plant and the plans of the company call for the doubling of the present capacity.

Philadelphia

New Steel Contracts Show $2 Advance to Consumer—Heavy Melting Steel 50c a Ton Higher

PHILADELPHIA, Oct. 2.—Most of the steel being shipped is evidently destinued for immediate or early consumption, so that very little material is accumulating in stocks. This is also true of pig iron and iron and steel scrap. In the last week of September, specifications against third quarter steel contracts were heavy and there was substantial contracting for bars and plates for this quarter, in practically all cases at a $2 a ton advance to the buyer, based on the price of his previous contract. Structural shapes are firmer at 2.05c., Pencoyd, Pa. Sheet mills have specifications on their books sufficient to occupy them for the next six weeks and have apparently succeeded in applying the new discount of one-half of 1 per cent for cash in 10 days, although the 2 per cent discount will appear on a large percentage of invoices this month, as specifications were furnished by the buyers prior to Oct. 1.

Pig Iron.—Except for purchases of carload or 100-ton lots of foundry iron, the market is inactive. Consumers, however, are in most cases pressing for prompt deliveries against their contracts and evidently are using iron as rapidly as it is received. Furnace stocks are also decreasing, and it is estimated that in the Buffalo district furnace stocks have in the past three months been reduced fully 125,000 tons. This is attributed in part to shipments to consumers, but also to increased use of their own iron by steel company producers. Eastern Pennsylvania furnaces are comfortably booked with tonnage and are maintaining a $20 base, furnace, on foundry grades. On Sept. 28 the Brooke furnace at Birdsboro, Pa., was blown in, having been out of blast since May 1 for rebuilding. Low phosphorus demand is fair; the northern New York producer, which recently went out of blast, is reported to have considerably reduced its stock at the furnace.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$20.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.26
East. Pa. No. 1X	21.76
Basic (del'd east. Pa.)	$19.00 to 19.25
Gray forge	19.75 to 20.25
Malleable	21.00 to 21.50
Stand. low phos. (f.o.b. N. Y. State furnace)	22.00 to 23.00
Cop. b'r'g low phos. (f.o.b. furnace)	23.00 to 23.50
Va. No. 2 plain, 1.75 to 2.25 sil.	24.54
Va. No. 2X, 2.25 to 2.75 sil.	25.04

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Ferromanganese.—Consumers are requisitioning heavily on current contracts. The price is unchanged at $105 per ton, seaboard, the quotation of domestic producers and importers. The advance last week of $5 a ton in the price quoted for export by British producers was apparently applied only to European markets, as importers here have received no notice of a price revision.

Billets.—Some mills are asking $34 per ton for small lots of rerolling quality, but on a substantial tonnage $33 per ton, Pittsburgh, for rerolling and $38, Pittsburgh, for forging quality are still available quotations.

Bars.—Contracting for fourth quarter delivery is reported to have been heavy, particularly in the past week. Mills are generally booked with tonnage sufficient to occupy them for the next four to six weeks. In most cases, contracts have been made at $2 a ton advance to the consumer. Buyers who have been receiving deliveries on contracts at 1.80c., Pittsburgh, have made new commitments at 1.90c., Pittsburgh, and those with 1.85c. per lb. contracts for third quarter, have bought for the remainder of the year at 1.95c., Pittsburgh. Small lots are bringing 2c., base Pittsburgh, so that the range for Philadelphia delivery is quotable at 2.22c. to 2.32c. per lb.

Shapes.—Prices are beginning to show more stability with the new quarter, as it is generally understood that contracts at 1.90c. and 1.95c. per lb., Pencoyd, Pa., terminated with September. Mills are now asking 2.05c., Pencoyd, as a minimum. Fabricating shops are well occupied with tonnage and maintaining a better level of prices on recent bids.

Plates.—Consumers exhibited but little interest in last quarter contracts until the final week of the quarter, when a good volume of new business was booked at advances of $2 a ton, prices ranging from 2.05c., Coatesville, to large or preferred buyers, to 2.15c., Coatesville, on small tonnages. The average contract price has been 2.10c., Coatesville, or 2.20c., delivered Philadelphia.

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.60c.
Plates, ⅜-in.	2.80c.
Structural shapes	2.60c.
Soft steel bars, small shapes, iron bars (except bands)	2.70c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforc. steel bars, sq. twisted and deform.	2.50c. to 2.75c.
Cold-fin. steel, rounds and hex.	3.45c.
Cold-fin. steel, sq. and flats	3.95c.
Steel hoops	3.50c.
Steel bands, No. 12 to ⅛-in., inclus.	3.25c.
Spring steel	5.00c.
*Black sheets (No. 24)	3.85c.
†Galvanized sheets (No. 24)	4.60c.
Blue ann'l'd sheets (No. 10)	3.15c.
Diam. pat. floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

Sheets.—Sheet mills which permitted customers to specify against third quarter contracts up to the last day of September received very heavy shipping orders last week. In addition, there was a considerable amount of contracting for the fourth quarter at the new prices, which are 2.75c. for black, 3.50c. for galvanized and 2c. for blue annealed, Pittsburgh base. The extra of 10c. per 100 lb. for widths of blue annealed greater than 45 in. is evidently being much more firmly adhered to by the mills than was true in the third quarter. Although a considerable portion of the sheet shipments this month will take the 2 per cent cash discount, the new discount of one-half of 1 per cent is now in effect on all specifications received on or after Oct. 1.

Old Material.—Prices on most grades have become steadier. Mills are receiving sufficient scrap for their present requirements. A Harrisburg user has bought stove plate at $13, yard steel at $13 and heavy breakable cast at $17, and is now offering 50c. a ton less than these prices. No. 1 steel has been bought by a Claymont, Del., consumer at $16 a ton, a 50c. a ton advance from the last previous purchase price of the same buyer. The largest eastern Pennsylvania consumer of heavy melting steel is reported to have closed on a tonnage recently, but no price is named. The situation in low phosphorus scrap, couplers and knuckles and rolled steel wheels renders it difficult to determine the price to a consumer. One large producer of low phosphorus has recently refused to sell at $20 a ton, yet brokers say that there is no consumers' market at present. A similar situation exists in the market on steel wheels and couplers and knuckles.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$16.00
Scrap T rails	$15.50 to 16.00
No. 2 heavy melting steel	13.00 to 13.50
No. 1 railroad wrought	15.50 to 16.00
Bundled sheets (for steel works)	11.00 to 11.50
Machine shop turnings (for steel works)	11.50
Heavy axle turnings (or equiv.)	12.50 to 13.50
Cast borings (for steel works and roll. mill)	11.00 to 11.50
Heavy breakable cast (for steel works)	16.50 to 17.00
Railroad grate bars	12.50 to 13.00
Stove plate (for steel works)	12.50 to 13.00
No. 1 low phos., hvy., 0.04% and under	19.00 to 20.00
Couplers and knuckles	17.00 to 17.50
Rolled steel wheels	17.00 to 17.50
No. 1 blast f'nace scrap	10.00
Wrot. iron and soft steel pipes and tubes (new specific.)	14.50 to 15.00
Shafting	19.00 to 20.00
Steel axles	22.00 to 23.00
No. 1 forge fire	11.00 to 11.50
Cast iron carwheels	16.50 to 17.00
No. 1 cast	17.00 to 17.50
Cast borings (for chem. plant)	14.50 to 15.00
Steel rails for rolling	15.50 to 16.00

Warehouse Business.—Jobbers report a fair volume of buying, and prices are quite firm. September was a fair month. The size of orders for all products is beginning to show improvement, which jobbers attribute to the well-filled condition of the mills.

Imports.—In the week ended Sept. 29, pig iron arrivals at this port totaled 2477 tons, of which 2075 tons was British and 402 tons was Dutch iron. A total of 271 tons of iron ore was received, 261 tons from Spain and 10 tons from the United Kingdom; 4768 tons of manganese ore came in from British West Africa. Steel arrivals consisted of 146 tons of structural shapes from Germany and 122 tons of steel bars from Sweden.

Cleveland

Heavy Specifications at Close of Third Quarter and New Contracting Produce Added Strength

CLEVELAND, Oct. 2.—Heavy specifications for steel bars, structural material and plates came out during the last few days of September against third quarter contracts. With higher prices prevailing for this quarter, very little tonnage was left unspecified on expiring contracts. Some of the local sales offices report that the tonnage entered in September broke previous records of the year, with the exception of one month. A goodly number of fourth quarter contracts were taken during the week at $2 a ton above the prices the same consumers paid in the last quarter. Many of these were closed at 1.90c. to 1.95c., Pittsburgh, for steel bars, plates and structural shapes, with some at 2c., although the higher price usually applies to small buyers of miscellaneous lots who are not likely to contract.

A local mill has announced that it will hold to the Pittsburgh mill price for steel bars for the fourth quarter, using Cleveland as a basing point. However, some local consumers have been able to contract for the fourth quarter at 1.85c., Cleveland. Outside mills, using Cleveland as a basing point on steel bars, are naming 1.95c. to 2.05c., Cleveland. Some of the plate consumers are buying only for current needs, not being fully convinced that present prices will hold.

Specifications from the automotive industry are holding close to the recent volume. Several of the motor car companies are sounding out the market with inquiries for first quarter prices for sheets and hot-rolled strip steel. The Chevrolet Motor Car Co. is in the market for stampings for its new models for deliveries extending through the first quarter, and some of the stamping plants that are figuring on this work are asking for prices on blue annealed sheets for deliveries extending over six months, but mills are not ready to make quotations that far ahead.

The Wheeling & Lake Erie Railroad has purchased 1000 tons of rails from the Carnegie Steel Co.

Pig Iron.—Several inquiries for foundry and malleable iron totaling 20,000 tons or more came out during the week. An Indiana melter asked for 6000 tons and a Michigan foundry for 3000 tons, both wanting malleable grades. One producer may open its books this week for the first quarter at a 50c. a ton advance over the current market price. Others have not yet given consideration to first quarter prices. Sales for this quarter continue to taper off. Cleveland interests booked 26,500 tons during the week. Foundries are pretty well covered for the remainder of the year, and it is expected that additional buying will be mostly in small-lot orders from consumers who will need more iron or from those who buy from hand to mouth. The only change in the price situation on foundry and malleable grades is a firmer tone in the Michigan market, where there has been a spread of from $18 to $18.50. The lower price has disappeared. For outside shipment, Cleveland furnaces quote foundry and malleable iron at $17.50. Interest in the basic market has been stirred by two inquiries. One of these from the Central Alloy Steel Corporation is for 15,000 tons for October-November shipment. Both prospective buyers were unable to find a producer who would sell basic at $17. Cleveland furnaces have no basic to sell, but one Valley producer stated that it might make a sale at $17.50. The last basic sale was at $16.25. Shipping orders are holding up to recent volume, and there is no sign of a slowing down in the demand from the automotive industry.

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struct. shapes	3.00c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.25c. to 2.50c.
Cold-fin. rounds and hex	3.65c.
Cold-fin. flats and sq	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.50c.
Galvanized sheets (No. 24)	4.25c.
Blue ann'l'd sheets (No. 10)	3.35c.
No. 9 ann'l'd wire, per 100 lb	$2.85
No. 9 gal. wire, per 100 lb	3.30
Com. wire nails, base per keg	2.85

*Net base, including boxing and cutting to length.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	$18.50
S'th'n fdy., sil. 1.75 to 2.25	22.25
Malleable	18.50
Ohio silvery, 8 per cent	28.00
Basic Valley furnace	17.00
Stand. low phos., V'ley fur.	$26.50 to 27.00

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Sheets.—A fair amount of business has been taken at regular prices, both in orders for early shipment and in fourth quarter contracts. Good order books are helping to strengthen the price structure, as some of the mills are four weeks behind on deliveries on black sheets and six weeks behind on auto body sheets. Black sheets appear well established at 2.75c., Cleveland. Blue annealed sheets, on which there has been some shading, are now holding rather firmly at 2c. No price deviation is reported on galvanized sheets, although these have not been well tested.

Semi-Finished Steel.—A local producer has sold 1500 tons of billets at $34, Cleveland, for the fourth quarter, and it is expected that this price will be definitely established, with sheet bars $1 a ton lower. Consumers are still taking heavy shipments against $32 and $33 contracts.

Wire Products.—Many consumers have covered for the fourth quarter at the regular quotations, which are being maintained by leading producers. However, there is price shading in some sections. Manufacturers' wire is in heavy demand.

Reinforcing Bars.—Inquiry has improved. Rail steel bars have been advanced $2 a ton to 1.85c., mill. Some jobbers have advanced the stock price to 2.25c., Pittsburgh, or 2.44c., Cleveland.

Warehouse Business.—Cleveland jobbers on Oct. 1 advanced warehouse prices $2 a ton on black and galvanized sheets. Other prices are unchanged. Warehouse business is good.

Iron Ore.—Shipments of Lake Superior ore by water during September amounted to 8,748,286 tons, a gain of 1,518,245 tons over those of the same month last year. The total movement up to Oct. 1 was 41,265,979 tons, or a decrease of 1,117,978 tons, compared with the same period last year. September shipments fell off about 500,000 tons compared with August. Present indications are that the movement for the season will be quite a little ahead of last year's.

Coke.—Domestic by-product coke is moving in good volume at $4.50, Ohio ovens, for egg size. There is not much activity in foundry coke, which is unchanged at $7.75, Painesville, for Ohio by-product coke and at $3.50 to $4.85, ovens, for Connellsville coke.

Bolts, Nuts and Rivets.—Specifications for bolts and nuts are fair from practically all consuming industries, as well as from jobbers. September orders fell slightly below those of August, during which the volume was unusually good for a summer month. The industry is operating at 60 to 65 per cent of capacity. Rivet orders are moderate.

Strip Steel.—Specifications for hot-rolled strip continue to come out in good volume, but there is little new business, as all except the very small consumers are covered at the third quarter prices. Mills have taken quite a few fourth quarter contracts for cold-rolled strip at 2.75c., Cleveland and Pittsburgh, and the market now appears well established at that

price. Some small-lot business is being taken at 2.85c.

Old Material.—The market is very firm and several grades have advanced. To cover on short orders, dealers are paying the maximum prices that have prevailed recently. A Youngstown mill is reported to have bought No. 1 heavy melting steel at $16, and dealers are offering up to $15.75, delivered, to cover against this order. There have been some transactions in No. 2 heavy melting steel at $13 to $13.25. Machine shop turnings have advanced 50c. a ton. For this grade, dealers are paying $9.50, delivered Cleveland, and $11.50, delivered Youngstown. Cast scrap has also advanced 50c., a round lot bringing $17 locally. Dealers are paying $10.50 for blast furnace scrap. The scrap offered by Michigan automobile companies last week brought good prices. As the Pittsburgh market on heavy melting steel is $1 a ton higher than the Valley market, while the Youngstown district has only a 50c. a ton advantage in freight rates from Detroit, scrap from the latter city is moving more heavily to Pittsburgh than to Youngstown.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$13.75 to $14.00
No. 2 heavy melting steel	13.25 to 13.50
Compressed sheet steel	13.00 to 13.50
Light bundled sheet stamp'gs	11.50 to 11.75
Drop forge flashings	12.00 to 12.50
Machine shop turnings	9.00 to 9.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	13.75 to 14.25
No. 1 busheling	11.50 to 12.00
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phos. forging crops	16.00 to 16.50
Low phos., billet, bloom and slab crops	17.00 to 17.50
Low phos. sheet bar crops	16.50 to 17.00
Low phos. plate scrap	15.50 to 16.00
Blast Furnace Grades	
Cast iron borings	10.25 to 10.50
Mixed bor'gs and short turn'gs	10.25 to 10.50
No. 2 busheling	10.25 to 10.50
Cupola Grades	
No. 1 cast	16.50 to 17.00
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft.	16.75 to 17.25
Miscellaneous	
Railroad malleable	15.00 to 15.50
Rails for rolling	16.25 to 16.50

New York

Steel Bids to Railroad Show Strength of Prices—Pig Iron Market Quiet

NEW YORK, Oct. 2.—The pig iron market is quiet, reflecting the fact that most of the larger buyers have placed contracts for the current quarter. In line with their recent announcement of an advance for first quarter, some Buffalo producers have introduced a clause in fourth quarter contracts stipulating that iron not shipped by Jan. 1 will be marked up 50c. a ton. A current inquiry calls for 500 tons for delivery in the first quarter, but otherwise there are no evidences of interest in iron for that period. Business, for the most part, consists of relatively small tonnages for early shipment. Sales in this district during the week totaled about 8500 tons. Stocks on furnace banks have been reduced, and in some cases certain grades of iron are not available for prompt delivery. The movement of wheat on the State barge canal has passed its peak, and a larger amount of pig iron is moving by water. The season is so late, however, that it is doubtful whether Buffalo producers will succeed in piling much stock iron at New Jersey ports. Buffalo foundry iron is unchanged at $17, base furnace.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$21.91
*Buf. No. 2, del'd east. N. J.	20.28
No. 2, del'd east. N. J. tidewater	$19.51 to 20.01
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.89 to 22.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	21.39 to 22.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	21.89 to 23.02

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.
*Price delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

Reinforcing Bars.—The Jones & Laughlin Steel Corporation has booked 1400 tons for an automobile garage and service station in Manhattan. Other sizable awards during the week were 850 tons for a causeway at Jones Beach, L. I., to E. T. Edwards; 550 tons for a barracks on Governor's Island, to Igoe Brothers, and 500 tons for two sections of the subway and 340 tons for a dam at Albany, N. Y., to the McClintic-Marshall Co. The activity of the market was prompted by a $2 increase in price which became effective Oct. 1. For shipment from mill, distributers are now quoting 2c., Pittsburgh, and are adhering to the policy of shipping only in 40, 50 and 60-ft. lengths. On shipments cut to length the general quotation is 2.25c., Pittsburgh mill warehouse, or 2.59c., on cars at New York. Out of New York warehouse, prices are unchanged at 2.80c. per lb. for lots of 5 tons or more, 2.95c. for lots of 2 to 5 tons, and 3.24c. for less than 2 tons, all delivered at job.

Ferroalloys.—Sales of 200 to 300 tons of ferromanganese are noted at $105, seaboard, together with transactions in spiegeleisen of several carloads and small lots at unchanged prices. British agents of ferromanganese producers have not been notified of any advance in this market.

Plates, Shapes and Bars.—At the opening of bids today (Tuesday) by the New York Central Railroad on its fourth quarter requirements, there was a general adherence among bidders to the prices that have recently been reported as covering the range which the steel mills are asking industrial users of steel for the remainder of the year. The Carnegie Steel Co. quoted 1.90c., Pittsburgh or Youngstown, on plates, shapes and bars for delivery to points west of the Buffalo district, while for Eastern shipment its quotation was 2c., West Seneca, N. Y. The Otis Steel Co. quoted 1.90c., Cleveland, on plates, and the Corrigan-McKinney Steel Co. and the Bourne-Fuller Co. quoted 1.90c., Cleveland, on bars, while the Republic Iron & Steel Co. named 1.90c. at Youngstown on bars. The Jones &

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.50c.
Flats and squares	4.00c.
Cold-roll. strip, soft and quarter hard	5.15c. to 5.40c.
Hoops	4.50c.
Bands	4.00c.
Blue ann'l'd sheets (No. 10)	3.85c. to 3.90c.
Long terne sheets (No. 24)	5.60c. to 5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, 1½ x ⅝ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases,	4.50c. to 7.00c.
	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	60
1 x 16 in. and smaller	50 to 50 and 10
Boiler Tubes—	Per 100 Ft.
Lap welded, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discount on Welded Pipe

Standard Steel—	Black	Galv.
⅛-in. butt	46	29
¼-in. butt	51	37
1-3-in. butt	58	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
⅛-in. butt	5	+19
¼-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 *in.*)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20

Charcoal, per Box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 *in.*)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.60c. to 3.80c.
No. 22	3.75c. to 3.95c.
No. 24	3.80c. to 4.00c.
No. 26	3.90c. to 4.10c.
No. 28*	4.05c. to 4.25c.
No. 30	4.30c. to 4.50c.

Sheets, Galvanized

	Per Lb.
No. 14	4.15c. to 4.35c.
No. 16	4.00c. to 4.20c.
No. 18	4.15c. to 4.35c.
No. 20	4.30c. to 4.50c.
No. 22	4.35c. to 4.55c.
No. 24	4.50c. to 4.70c.
No. 26	4.75c. to 4.95c.
No. 28*	5.00c. to 5.20c.
No. 30	5.40c. to 5.60c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Laughlin Steel Corporation quoted 2c., Pittsburgh, on all three products; the Bethlehem Steel Co.'s price was 2c., West Seneca, N. Y.; the Youngstown Sheet & Tube Co.'s quotation was 2c., Youngstown. The Donner Steel Co. quoted 2c., Buffalo, on bars. Eastern plate mill quotations varied, the Lukens Steel Co. asking 2.10c., Newberry Junction, the Central Iron & Steel Co., 2.05½c., Newberry Junction, or 2.12½c., West Albany, and the Alan Wood Iron & Steel Co.'s price was 2.18½c., Newberry Junction. Chicago mills quoted 2.05c., mill, on all three products, while the Granite City Steel Co. put in a price of 2c., mill, on plates. These prices were generally from $1 to $3 a ton higher than were quoted on the New York Central's inquiry for third quarter. During the past week, a good deal of fourth quarter contracting has been done, with prices ranging from 1.90c. to 2c., Pittsburgh, on bars; from 2.22½c. to 2.32½c., New York, on plates, and from 2.19½c. to 2.29½c., New York, on shapes. Mills which permitted customers to specify against third quarter contracts up to the last day of September received very heavy specifications last week. Most of the Eastern plate mills fixed no time limit for specifications, and they were among those which received large shipping orders last week, some buyers specifying as much as 2000 tons for stock. Although Dec. 10 or 15 is the time limit for specifications for bars and shapes in fourth quarter contracts, some of the plate mills will permit specifying up to Dec. 25.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.24c. to 2.34c.; plates, 2.22½c. to 2.32½c.; struc. shapes, 2.19½c. to 2.22½c.; bar iron, 2.14c.

Cast Iron Pipe.—Orders for pressure pipe seldom exceed 100 tons, and most of the buying is limited to carload lots or less. Even the large privately owned public utility companies are buying a few hundred tons of pipe at a time. One such corporation, which buys in New York, closed last week on about 250 tons of water pipe. Prices continue at about $35.60 to $36.60 per net ton, delivered New York, the quotation of Northern makers, and at $36 to $37 per ton, base Birmingham, the price of Southern foundries. The State of New York is inquiring for 168 tons of 6-in. to 30-in. Class A pipe for shipment to an institution at Orangeburg, N. Y. The State of Massachusetts is in the market for about 350 tons of 6-in., 8-in. and 10-in. Class B pipe for Waverly, Mass.

Prices per net ton, deliv'd New York: Water pipe, 6-in. and larger, $35.60 to $36.60; 4-in. and 5-in., $40.60 to $41.60; 3-in., $50.60 to $51.60; Class A and gas pipe, $4 to $5 extra.

Sheets.—Sales of black and galvanized sheets in lots ranging from 100 to 300 tons have been made within the past few days at the new prices, namely 2.75c., Pittsburgh, for black and 3.50c. for galvanized. Some buyers evidently had overstayed the market in the expectation that the $2 advance on black and galvanized would not become effective. Mills have such large backlogs that they are not interested in orders at less than the new prices, which seem to be firmly established. In blue annealed sheets, an indication of the stronger position taken by producers is the almost uniform insistence on an extra of 10c. per 100 lb. on widths exceeding 45 in., whereas in the third quarter this extra was frequently waived.

Warehouse Business.—Jobbers report an increase in the size of individual orders, especially in structural steel and bars, users evidently being unable to obtain early deliveries from the mills. Black, galvanized and blue annealed sheets are firmer in price, a reflection of the well-filled condition of mills. One large jobber in this district has recently shipped about 200 tons of galvanized and black sheets to Porto Rico, where immediate shipment for use in reconstruction work was a factor. September business was considerably in excess of that done in August, and the month ranked favorably with earlier months of the year.

Coke.—Standard furnace coke continues firm, producers quoting from $2.85 to $3 per ton, Connellsville. Standard foundry coke is quoted at $3.75 per ton, Connellsville, for ordinary grades and special brands are unchanged at $4.85 per net ton, ovens. Delivered prices of special brands are $8.56 per ton to northern New Jersey and Newark, and $9.44 to New York and Brooklyn. By-product foundry coke prices are $9 to $9.40, Newark or Jersey City, and $10.06, New York or Brooklyn.

Old Material.—No. 1 heavy melting steel is now being bought at $14.50 to $15.50 per ton, delivered eastern Pennsylvania, the lower price being for shipment to Bethlehem, Pa., and the higher quotation on tonnages for Coatesville, Pa., and Claymont, Del. Yard grade ranges from $11.75 per ton, delivered Pottsville, Pa., to $13 per ton, delivered Conshohocken, Pa. Brokers buying blast furnace scrap have advanced buying prices to $10 per ton, delivered. Foundry grade of stove plate is being bought at $12 per ton, delivered to a consumer at West Mahwah, N. J. Most eastern Pennsylvania consumers of scrap are better supplied than a fortnight ago, and in one instance a mill has temporarily reduced its offering price for heavy breakable cast, stove plate and yard steel by 50c. a ton, having received on old contracts a heavy tonnage of material, which will require several days to unload and pile.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	$11.50 to	$12.00
Heavy melting steel (yard)	8.00 to	9.50
No. 1 hvy. breakable cast.	12.50 to	13.50
Stove plate (steel works).	8.75 to	9.00
Locomotive grate bars....	9.25 to	9.75
Machine shop turnings....		7.50
Short shoveling turnings..		7.50
Cast borings (blast furn. or steel works)	6.50 to	7.50
Mixed borings and turnings	6.75 to	7.25
Steel car axles.....	18.00 to	18.50
Iron car axles.....	24.75 to	25.75
Iron and steel pipe (1 in. dia., not under 2 ft. long)		10.75
Forge fire	7.25 to	7.75
No. 1 railroad wrought...	10.75 to	11.25
No. 1 yard wrot., long....	8.75 to	9.25
Rails for rolling.....	11.50 to	12.00
Cast iron carwheels.....	13.00 to	13.50
Stove plate (foundry)....	9.50 to	10.00
Malleable cast (railroad).		10.00
Cast borings (chemical)..		11.25

Prices per gross ton, deliv'd local foundries:

No. 1 machy. cast.....	$16.50
No. 1 hvy. cast (columns, bldg. materials, etc.) cupola size	14.50
No. 2 cast (radiators, cast boilers, etc.)	14.00

Railroad Equipment

Canadian National Inquires for 1500 Box Cars

PURCHASE of 35 locomotives by the Canadian National, in addition to the 20 mentioned last week, and an inquiry from this road for 1530 freight and 43 passenger cars featured the equipment market during the week. Other inquiries included 500 underframes for the Great Northern and from 200 to 400 tank cars for the Union Tank Line. Details of the week's business follow:

Canadian National has distributed orders for 55 locomotives as follows: 20 4-8-4 Northern type to American Locomotive Co. through Montreal Locomotive Works, Ltd., as mentioned in THE IRON AGE last week; 10 eight-wheel switching locomotives to Montreal Locomotive Works, Ltd.; 15 Santa Fe type and 10 eight-wheel switching to Canadian Locomotive Co. Road has made additional inquiry for five locomotives of modified design Mountain type, and also expects to buy 1500 box and 30 tank cars, 25 first-class coaches, 16 sleeping cars and two combination baggage and smoking cars.

Central Vermont has ordered two 2-10-4 type locomotives from American Locomotive Co.

Illinois Terminal Co. is inquiring for one Mikado type locomotive.

Denver & Rio Grande Western has made inquiry for four dining cars.

American Railroad of Porto Rico has ordered 100 cane cars from Gregg Co., Ltd.

Freeport Sulphur Co., New York, is inquiring for 15 steel hopper car bodies.

Great Northern is inquiring for 500 underframes in addition to 2000 recently placed with its own shops.

New York, New Haven & Hartford has ordered 10 transformer cars from Osgood-Bradley Car Co.

Union Tank Line is inquiring for 100 to 200 10,000-gal. tank cars and 100 to 200 6500-gal. tank cars.

Cerro de Pasco Copper Corporation, New York, has ordered 20 freight cars from American Car & Foundry Co.

San Francisco

Oil Tank Awards Take 3000 Tons of Plates — Structural Lettings of 4000 Tons

SAN FRANCISCO, Sept. 29 (*By Air Mail*).—Among the developments in the iron and steel markets on the Pacific Coast this week was the placing of over 3000 tons of plates and 4000 tons of structural shapes. The plates were for oil storage tanks for the Shell Oil Co. and the Rio Grande and Barnsdall oil companies.

Pig Iron.—Movement of foundry pig iron continues limited to small lots, and no large inquiries have come up for quotations recently. No change in quotations is noted.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah fdy., sil. 2.75 to 3.25	25.00 to 26.00
**Indian fdy., sil. 2.75 to 3.25	24.00 to 25.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Bars.—Only two awards of reinforcing steel bars exceeding 100 tons were reported. The largest letting involved 500 tons for the India Basin power plant of the Great Western Power Co., San Francisco, and was placed with the Pacific Coast Steel Co. New inquiries include 575 tons for buildings at Fort Lewis, Wash. An award is expected next week on 1800 tons for a college building at Berkeley. Importations in June totaled 2487 tons.

Plates.—The feature of the plate market this week was the award of five 80,000-bbl. tanks, involving 1550 tons, for the Rio Grande and Barnsdall oil companies, Santa Barbara, Cal., to McClintic-Marshall Co. and five 80,000-bbl. tanks, calling for a like tonnage, for the Shell Oil Co. at Martinez, Cal., booked by the Western Pipe & Steel Co. Pending tankage business includes 10 80,000-bbl. tanks for the Shell Oil Co. at Domingues, Cal., involving 3100 tons, and 5000 tons for 14 82,000-bbl. tanks for the General Petroleum Corporation, Los Angeles. Bids are to be opened Oct. 10 on 1200 tons for a pipe line at Hood River, Ore. No change in prices is noted, 2.20c. to 2.25c., c.i.f., representing the market.

Shapes.—Bookings of structural material were heavy this week and included 1200 tons for the Richfield Oil Building, Los Angeles, placed with the Llewellyn Iron Works, 550 tons for a factory addition at Tacoma, Wash., 725 tons for a warehouse at San Diego, and 325 tons each for two apartments in Los Angeles. McClintic-Marshall Co. was low bidder on 2500 tons for a mill building at Pittsburg, Cal., for the Columbia Steel Corporation. Pending business exceeds 10,000 tons and includes 2000 tons for a power plant at San Francisco for the Great Western Power Co. and 2000 tons for a department store in Los Angeles. Imports during June totaled 1455 tons. No change in prices on plain material is noted, 2.35c., c.i.f., being firm.

Cast Iron Pipe.—A lull in demand for cast iron pipe developed in the week. The American Cast Iron Pipe Co. took 200 tons of centrifugal pipe for Fifty-first Avenue N. E., Seattle, and the United States Cast Iron Pipe & Foundry Co. secured 212 tons for the Hanford Street sewer tunnel in Seattle. Bids were opened this week on 142 tons of 4 to 14-in. Class B pipe for Oxnard, Cal. No new inquiries developed. In June, 1231 tons was imported.

Steel Pipe.—Demand for oil country goods, especially oil well casing, continues unabated and pipe mill representatives report a better movement of standard steel pipe. Importations of tubular products in June totaled 2169 tons.

Coke.—Sales and inquiries for foundry coke are light and have involved small tonnages. Importations in June totaled 4901 tons.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.15c.
Soft steel bars	3.15c.
Small angles, 1/8-in. and over	3.15c.
Small angles, under 1/8-in.	3.55c.
Small channels and tees, 3/4-in. to 2 3/4-in.	3.75c.
Spring steel, 1/4-in. and thicker	5.00c.
Black sheets (No. 24)	5.00c.
Blue ann'l'd sheets (No. 10)	4.00c.
Galv. sheets (No. 24)	5.40c.
Struc. rivets, 1/2-in. and larger	5.65c.
Com. wire nails, base per keg	$3.40
Cement c't'd nails, 100-lb. keg	3.40

St. Louis

Steady Buying of Pig Iron—Steel Mills in Strong Position —Scrap Prices Make Further Gains

ST. LOUIS, Oct. 2.—Buying of pig iron continues at a moderately heavy rate, and the market is firm at unchanged prices. The St. Louis Gas & Coke Corporation sold 5000 tons, including 2000 tons of basic iron and 500 tons of foundry, to local melters for prompt shipment, the remainder being for fourth quarter delivery. The leading Southern maker sold 1000 tons, including 400 tons to a specialty maker in the district, for shipment in the remainder of the year. An Iowa wheel manufacturer took 1000 tons of foundry iron, two implement manufacturers each took 300 tons of foundry iron, and a California melter bought 300 tons of malleable from the Granite City maker. Implement manufacturers are enjoying a heavy melt, as are jobbing foundries catering to agricultural lines. Stove plants are making heavy shipments, and are busy on new work.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$19.50 to $20.00
N'th'n No. 2 fdy., deliv'd St. Louis.	20.16
Southern No. 2 fdy., deliv'd	20.67
Northern malleable, deliv'd	20.16
Northern basic, deliv'd	20.16

Freight rates: 81c. Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Coke.—Colder weather has greatly stimulated the sale of domestic coke to dealers, and there is generally a better feeling in this field. Buying of foundry grades continues on an immediate need basis.

Finished Iron and Steel.—The Laclede Steel Co. and the Missouri Rolling Mills Corporation have advanced the price of reinforcing bars $2 a ton. An advance of $2 a ton on plates, shapes and bars also was effective on Oct. 1. Mills have accumulated a heavy backlog of orders for galvanized sheets as a result of the rush to buy before the discount rate on these items was cut from 2 per cent to one-half of 1 per cent, and purchasing has stopped abruptly. Specifications for other products are satisfactory. Business with structural fabricators is quiet.

Old Material.—Further advances were made in prices of some items of old material during the week, and the whole list is strong. While there was very little buying by consumers, it is known that several mills are in need of scrap and will buy as soon as they and the dealers get together on prices. Dealers are short of some items, and further strength is given to the market here by improved conditions elsewhere. Miscellaneous standard section rails, railroad springs, machine shop turnings, No. 1 machinery cast and No. 1 railroad cast are 50c. higher; bundled sheets and stove plate are up 75c., and steel car axles are 25c. up. Railroad lists: Pennsylvania Lines, 43,120

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shafting, screw stock	3.75c.
Black sheets (No. 24)	4.10c.
Galv. sheets (No. 24)	4.95c.
Blue ann'l'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.15c.
Galv. corrug. sheets	5.00c.
Structural rivets	3.75c.
Boiler rivets	3.75c.
	Per Cent Off List
Tank rivets, 7/8-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-press. nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-press. nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

tons; Chicago, Burlington & Quincy, 4175 tons; Union Pacific, 2500 tons; Chicago, Indianapolis & Louisville, 585 tons; Missouri Pacific, 108 carloads; Chicago Milwaukee, St. Paul & Pacific, 104 carloads; Nickel Plate, 56 carloads; Big Four, 22 carloads.

Dealers' buying prices, per gross ton, f.o.b. St. Louis district:

Heavy melting steel	$12.00 to $12.50
No. 1 locomotive tires	12.50 to 13.00
Heavy shoveling steel	12.00 to 12.50
Miscel. stand.-sec. rails includ'g frogs, sw'ches and guards, cut apart	13.75 to 14.25
Railroad springs	15.00 to 15.50
Bundled sheets	9.00 to 9.50
No. 2 railroad wrought	12.00 to 12.50
No. 1 busheling	9.00 to 9.50
Cast iron boring	8.25 to 8.75
Iron rails	13.00 to 13.50
Rails for rolling	14.50 to 15.00
Machine shop turnings	8.50 to 9.00
Steel car axles	18.25 to 18.75
Iron car axles	26.50 to 27.00
Wrot. iron bars and trans.	19.25 to 19.75
No. 1 railroad wrought	10.75 to 11.25
Steel rails, less than 3 ft.	15.50 to 16.00
Steel angle bars	13.50 to 14.00
Cast iron carwheels	13.00 to 13.50
No. 1 machinery cast	14.50 to 15.00
Railroad malleable	12.50 to 13.00
No. 1 railroad cast	13.50 to 14.00
Stove plate	11.75 to 12.25
Agricult. malleable	11.50 to 12.00
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00

Youngstown

Steel Mills Well Supplied With Business

YOUNGSTOWN, Oct. 2.—Steel makers are so well supplied with business and are so definitely committed on production for the next 30 days that it is becoming difficult for buyers to interest them in additional tonnage except at the full fourth quarter prices. The quotations for the final quarter represent substantial advances in most finished products over those which have prevailed in the quarter just concluded and which are the bases of the bulk of the business now on the books for shipment this month.

On sheets, all makers in this area now are firm on new business at 2.75c., base, for black, 3.50c., base, for galvanized and 2c., base, for blue annealed. Strip prices for the remainder of this year are the same as those ruling during the second and third quarters on hot-rolled, but on cold-rolled an advance of $2 a ton has become well established, with the large lot price 2.75c., base, compared with 2.65c. in the third quarter. Fourth quarter contracts for steel bars have been entered at 1.90c., 1.95c., and 2c., base, prices having been determined by what the individual buyers paid on third quarter contracts. These prices are $2 a ton higher than those of the previous quarter.

However, it will probably be another month before the higher prices begin to become effective in invoices, because it was not possible to shut off specifications entirely on the heavy rolled products on third quarter contracts until the last day of September. Sheet mill bookings include considerable tonnage entered as third quarter business for shipment at convenience of the mill, which will be an obligation on this quarter's production. There will be improvement in the mill net prices on sheets, however, as every maker is firm in the plan for the lower discount for cash. On the base gages of sheets, the discount on galvanized sheets falls from 7c. per 100 lb. to 1.75c. at 3.50c., base; on black from 5.50c. per 100 lb. to 1.37½c. at 2.75c., base, and on blue annealed from 4c. to 1c. per 100 lb. on a base price of 2c.

Strictly new business is not heavy, but high mill engagement is not dependent upon active new buying in the presence of large obligations, and the insistence of consumers on very prompt shipments. This urgency for supplies runs to almost all products, but is expecially marked in those finding ultimate use in automobiles. Ingot production is easily 85 per cent of capacity, and, of the 26 steel works blast furnaces in the Mahoning and Shenango Valleys, 18 are making iron. In the finishing mills, the highest rate of operation is at the sheet mills, of which only a small percentage are idle. Tin plate mills are not doing so well as in the summer, but operations are making a good showing compared with this time last year. Strip mills capacity is largely engaged, and so are the bar mills. Seamless pipe mills and those producing the larger sizes of welded pipe are active, reflecting a strong demand for deep well casing and drill pipe and for oil and gas pipe lines. The wire mills are merely jogging along.

Primary materials are featured by a strong demand for basic iron and an indifference on the part of producers for business. Inquiries amounting to 12,000 tons of this grade recently have reached local producers, and have been turned down, not because the price was unsatisfactory, but because merchant furnaces appear to have none of this grade and the steel producers feel they will need all the iron they have or will produce during the remainder of the year. There is a very tight situation in the steel works grades of scrap, but most melters appear to have bought some time ago when prices were lower and now are merely demanding deliveries on those purchases and thus are escaping the higher prices lately reached.

Birmingham

Pig Iron Producers Well Booked—Steel Mills Enter Last Quarter with Good Backlogs

BIRMINGHAM, Oct. 2.—The weekly volume of new business in the pig iron market is holding up well and from the standpoint of forward bookings producers are in a better position than at any time in the past several months. Buying is principally in moderate lots. Considerable iron is yet to be purchased for the fourth quarter. Shipments last week dropped slightly from the average of the past few weeks. Production of foundry iron has been increased by the blowing in of No. 3 Woodward furnace of the Woodward Iron Co. on Sept. 29. This furnace was blown out on Aug. 21 for relining. Nineteen furnaces are now in blast, of which 11 are on foundry, six on basic, one on recarburizing iron and one on ferromanganese.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil	$16.25
No. 1 fdy., 2.25 to 2.75 sil	16.75
Basic	16.25

Finished Steel.—Fourth quarter prices are in effect with an advance of $2 a ton on bars, plates and shapes. Blue annealed sheets are now being quoted at 2.15c. Other sheet prices are unchanged. The one-half of 1 per cent discount rate was placed in effect on Oct. 1. Both orders and inquiries were unusually heavy during the past week and backlogs were further increased. New business booked during September was ahead of that in August, which was one of the best months of the year. All lines are active with the exception of steel rails. Specifications against contracts are running heavy. The structural steel market shows signs of recovering from the recent dull period. The Ingalls Iron Works Co. has orders for 100 tons for two airplane hangars at Pensacola, Fla., and 180 tons for the Gulf States Paper Corporation, Tuscaloosa, Ala. The Nashville Bridge Co. is beginning the fabrication of about 3000 tons of steel for the Chef Mentour and Rigolets bridges in Louisiana. New business of bar manufacturers has been good. New bookings of the Connors Steel Co. include 450 tons of bars for a school at New Orleans, 175 tons for a hotel at Huntsville, Ala., 150 tons for a school at Knoxville, Tenn., and 120 tons for a bridge at Mobile, Ala. Reeves Brothers are at work on an order for 66 oil storage tanks ranging in capacity from 55,000 bbl. to 120,000 bbl. No change has been made in open-hearth operations. The Tennessee company has 12 active, six at Fairfield and six at Ensley, and the Gulf States Steel Co. continues with four at Alabama City.

Cast Iron Pipe.—Pressure pipe manufacturers continue to book a steady volume of small orders sufficient to maintain plant operations at a normal rate for this season. A good volume of business is pending and makers expect some worthwhile tonnage shortly. Stocks are still being drawn upon occasionally. Prices have been advanced $2 a ton; quotations now are $36 to $37 on 6-in. and larger sizes.

Coke. — Consumers' requirements for foundry coke for the last quarter are covered. Practically all the important buyers have also covered for the first quarter. The usual amount of spot business is being done. There is a good run of orders for domestic coke. Quotations are unchanged from the $5 base for both spot and contract coke.

Old Material.—The market has become fairly stable at the prices which have prevailed for the past three weeks. Some activity is noted in all lines, but orders are largely for present needs. Shipments to mills continue active.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$10.00 to $11.00
Scrap steel rails	11.50 to 12.00
Short shoveling turnings	8.00 to 8.50
Cast iron borings	8.00
Stove plate	13.50
Steel axles	19.00 to 20.00
Iron axles	21.00 to 22.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	14.00
No. 1 cast	15.00
Tramcar wheels	13.00 to 14.00
Cast iron carwheels	13.00 to 13.50
Cast iron borings, chem	13.50 to 14.00

Canada

Structural Steel Orders Feature Markets—Large Railroad Purchases Expected Before End of Year

TORONTO, ONT., Oct. 2.—While the railroads have not placed their rail business for 1929 it is understood that large tonnages will be allotted before the end of the year. The Canadian National Railways placed orders for 55 locomotives with Canadian companies and is inquiring for five more, and is also in the market for 1500 50-ton box cars and 30 tank cars, 25 first-class coaches, two combination baggage-smoking cars and 15 sleepers.

The output of pig iron in Canada has declined somewhat from that of the high monthly average of June, but it is still greater than that of a year ago. August production amounted to 91,522 long tons, which was a slight decline from the 95,422 tons of July, but was 28,288 tons greater than that produced in August, 1927. For the eight months of this year, the total was 654,957 tons.

Pig Iron.—A rush of lagging melters to cover last quarter needs featured business in this market during the week. While tonnages involved in individual contracts were comparatively small, they totaled about 5000 tons. There are still a few who have not covered to the end of the year, but a large majority have bought. It is estimated by local blast furnace representatives that bookings for the last quarter exceed those of former quarters this year by about 15 per cent. Spot sales have continued in good volume. Radiator and sanitary ware manufacturing concerns have been extensive buyers both for spot and future delivery. While the agricultural implement industry is recognized as one of the largest consumers of pig iron in Canada, it procures practically its entire supply in the United States markets, because it has the advantage of duty-free iron. Canadian prices are strong.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$23.60
No. 2 fdy., sil. 1.75 to 2.25	23.60
Malleable	23.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	25.00
No. 2 fdy., sil. 1.75 to 2.25	25.00
Malleable	25.00
Basic	24.00
Imported Iron, Montreal Warehouse	
Summerlee	33.50
Carron	33.00

Structural Steel.—Most of the orders awarded during the past week were confined to lots under 500 tons, but two or three larger contracts were also closed and others are still pending. The Dominion Bridge Co., Montreal, reports orders for 5000 tons for the new Eaton Building in Toronto, and 6000 tons for the Dominion Square Building in Montreal. John T. Hepburn, Ltd., Toronto, has the contract to supply 500 tons of structural steel for building at University Avenue and Elm Street, Toronto. The Trussed Concrete Steel Co., Walkerville, Ont., has contract for 750 tons of steel for office building for S. E. Dinsmore, Ltd., Windsor, Ont. The Disher Steel Construction Co., Toronto, received an order for 250 tons of reinforcing bars for car barns at Oshawa, Ont., for Canadian National Electric Railways. For a new office building at Yonge and Colborne Streets, Toronto, for the Crown Life Insurance Co., about 5000 tons of steel will be required; 300 tons of reinforcing bars will be needed for the new Balfour Building, St. Lawrence Boulevard, Montreal.

Old Material. — Spot sales were strongly featured in transactions of the week. Shipping orders against old contracts, however, are appearing at regular intervals, and the movement of scrap is large. Heavy melting steel, turnings, machinery cast, wrought iron and steel axles are in the greatest demand. Prices are firm in the Toronto and Montreal markets.

Dealers' buying prices:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel	$9.00	$7.00
Rails, scrap	10.00	9.00
No. 1 wrought	9.00	11.00
Machine shop turnings	7.00	5.00
Boiler plate	7.00	6.00
Heavy axle turnings	7.50	6.50
Cast borings	7.50	5.00
Steel turnings	7.00	5.50
Wrought pipe	5.00	5.00
Steel axles	14.00	20.00
Axles, wrought iron	16.00	22.00
No. 1 machinery cast	....	16.00
Stove plate	....	13.00
Standard carwheels	....	16.00
Malleable	....	13.00
Per Net Ton		
No. 1 machinery cast	15.00	....
Stove plate	9.00	....
Standard carwheels	13.00	....
Malleable scrap	13.00	....

Buffalo

Pig Iron Prices Firm—Steel Mills Operating at 90 Per Cent —Scrap Prices Move Higher

BUFFALO, Oct. 2.—The steadiness of the pig iron price situation is shown by a sale of 250 tons to a district melter by a local furnace at $17.50, furnace, for No. 2X grade and at $18.50 for No. 1X. For shipment outside this immediate district, local furnaces are adhering to a $17 base for delivery during the remainder of this year and to $17.50 for first quarter. For delivery within the local territory, quotations are 50c. a ton higher both for last quarter and first quarter. Predictions of another price advance are prevalent. Inquiry now before local sellers amounts to about 2000 tons. The Hanna Furnace Co. has lighted its new stack, now having three in blast in this district. Pig iron shipments by barge canal for the week ended Sept. 29 were 900 tons.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$17.00 to $18.00
No. 2X fdy., sil. 2.25 to 2.75	17.50 to 18.50
No. 1X fdy., sil. 2.75 to 3.25	18.50 to 19.50
Malleable, sil. up to 2.25	17.50 to 18.50
Basic	17.00 to 17.50
Lake Superior charcoal	27.28

Finished Iron and Steel.—Bar, shape and plate prices are firm at 2c. to 2.10c., Buffalo. Some bars have been sold for 2.05c., Buffalo, and on small lots, 2.10c. is being obtained. Sheet business is very good at the recently established prices. A structural job amounting to 650 tons at Ithaca, N. Y., was awarded to a local fabricator. Average steel mill operation is about 90 per cent. Reinforcing bar business has tapered. Warehouse business continues to improve.

Old Material.—A large purchase of No. 1 heavy melting steel, No. 2 heavy melting steel and hydraulic compressed sheets was made during the week at $15.50 for the No. 1 grade. Between 10,000 and 15,000 tons is said to have been bought. At the same time, $16 has been paid for strictly No. 1 steel. A few sales of railroad malleable at $15.50 to $16 are re-

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-fin. flats, sq. and hex	4.45c.
Rounds	3.95c.
Cold rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$3.60
Black wire, base per 100 lb	3.75

ported, and some No. 1 machinery cast was sold at $15.25 to $15.50.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$15.50 to $16.00
No. 2 heavy melting steel	13.50 to 14.00
Scrap rails	14.50 to 15.00
Hydraulic comp. sheets	13.50 to 14.00
Hand bundled sheets	11.00 to 11.50
Drop forge flashings	13.50 to 14.00
No. 1 busheling	14.50 to 15.00
Hvy. steel axle turnings	13.00 to 13.50
Machine shop turnings	7.25 to 7.75
No. 1 railroad wrought	13.50 to 14.00
Hvy. steel axle turnings	13.00 to 13.50
Acid Open-Hearth Grades	
Knuckles and couplers	16.50 to 17.00
Coil and leaf springs	16.50 to 17.00
Rolled steel wheels	16.50 to 17.00
Low phos. billet and bloom ends	17.00 to 17.50
Electric Furnace Grades	
Short shov. steel turnings	12.00 to 12.50
Blast Furnace Grades	
Short shov. steel turnings	12.00 to 12.50
Short mixed borings and turnings	10.00 to 10.50
Cast iron borings	10.00 to 10.50
No. 2 busheling	11.00 to 11.50
Rolling Mill Grades	
Steel car axles	18.00 to 18.50
Iron axles	21.00 to 22.00
Cupola Grades	
No. 1 machinery cast	15.25 to 15.50
Stove plate	14.00 to 14.50
Locomotive grate bars	12.00 to 12.50
Steel rails, 3 ft. and under	17.00 to 17.50
Cast iron carwheels	13.00 to 13.50
Malleable Grades	
Industrial	16.00 to 16.50
Railroad	16.00 to 16.50
Agricultural	16.00 to 16.50

Detroit Scrap Market Stronger

DETROIT, Oct. 2.—Some further price advances have been registered during the past week in the scrap market in this district. Borings and short turnings and long turnings are 50c. higher. There is no sign of weakness, and dealers generally do not look for recessions from present prices in the near future.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$12.00 to $12.50
Borings and short turnings	8.50 to 9.00
Long turnings	7.50 to 8.00
No. 1 machinery cast	14.00 to 15.00
Automobile cast	19.00 to 20.50
Hydraul, comp. sheets	11.50 to 12.00
Stove plate	11.00 to 12.00
No. 1 busheling	9.50 to 10.00
Sheet clippings	7.50 to 8.00
Flashings	10.00 to 10.50

Italian Government Buys Steel Plant

HAMBURG, GERMANY, Sept. 15.—The Italian Government, according to a recent announcement, has acquired the Armstrong steel works at Pozzuoli, near Naples. The plant has a capacity of 80,000 tons a year. This will be the only Government-owned steel works in Europe, outside of Russia. Production of electric steel in Italy is expected to total about 300,000 tons this year, compared with 255,000 tons in 1927.

Boston

Pig Iron and Scrap Prices Are Stronger—Domestic Demand for Coke Rushes Ovens

BOSTON, Oct. 2.—Not more than 2500 tons of pig iron was sold through Boston brokers in the past week. The largest individual sale reported was 500 tons of No. 2X by the Mystic Iron Works to a Connecticut foundry at 75c. a ton higher than was quoted by that stack a fortnight ago, and equivalent to a shade under $17.50 a ton, Buffalo. Otherwise, sales were largely in car or 100-ton lots and included Buffalo, Alabama, western Pennsylvania, New York State and Indian iron, the last named at $21.25 to $21.75 a ton on dock here, duty paid. The feature of the market has been the activity in shipments on contracts. Foundries evidently are endeavoring to stock up before cold weather sets in. The rail and water movement from the Buffalo district into New England has been heavier than at any previous time this season, and stocks of regular grades of iron in Buffalo furnace yards are reported as down to practically nothing.

Foundry iron prices per gross ton deliv'd to most New England points:

*Buffalo, sil. 1.75 to 2.25		$21.91
*Buffalo, sil. 2.25 to 2.75	$21.91 to	22.41
†Buffalo, sil. 1.75 to 2.25		20.78
†Buffalo, sil. 2.25 to 2.75	20.78 to	21.28
East. Penn., sil. 1.75 to 2.25		23.65
East. Penn., sil. 2.25 to 2.75		24.15
Va., sil. 1.75 to 2.25		25.71
Va., sil. 2.25 to 2.75		26.21
Ala., sil. 1.75 to 2.25	23.16 to	25.02
Ala., sil. 2.25 to 2.75	23.66 to	25.52

Freight rates: $4.91 all rail and $3.78 rail and water from Buffalo; $3.65 from eastern Pennsylvania; $5.21 all rail from Virginia; $6.91 to 8.77 from Alabama.
*All rail rate. †Rail and water rate.

Coke.—New England ovens are swamped with business. The New England Coal & Coke Co. is still behind on foundry coke deliveries, with little indication of catching up during the next fortnight. Last week's colder weather created a large demand for domestic coke. The company last week reduced its stock pile more than 2000 tons, and on Oct. 1 advanced its retail price in the Boston district from $12.50 a ton to $13. The Providence Gas Co. is slightly behind on domestic coke deliveries, but is up to date on foundry coke. Both companies quote foundry coke at $11 a ton, delivered within a $3.10 freight rate zone. On Sept. 24 the first oven of the New Haven, Conn., coke plant was pushed.

Warehouse Business.—The movement of iron and steel out of warehouses has been gathering momentum since Labor Day. Consumers are still taking conservative amounts of stock, but are buying more often. Warehouses are holding more rigidly to listed prices.

Old Material.—With liberal shipments now going to eastern Pennsylvania, while those to the Pittsburgh district are holding up well, the old material market is more active. Continued buying of scrap for export also contributes to the activity. There is a narrow market for railroad and yard wrought, but practically all other kinds of scrap are selling, and prices generally are strong, with an upward tendency. Some brokers have raised their price on heavy melting steel 25c. a ton to $11, on cars, shipping point; steel turnings and mixed borings and turnings are up 25c. to $6.75, on cars, and specification pipe is 50c. higher at $10, on cars. At least one shipper last week paid as high as $7.50 a ton, on cars, for forge scrap, but $7 appears to be the general limit. The same shipper paid $15 a ton, on cars, for shafting, which is 50c. more than most brokers have been offering. It is estimated that 10,000 tons of scrap will be exported from Boston between now and Jan. 1. On Oct. 8 the Boston & Albany Railroad will close bids on 1000 tons of No. 1 rails and miscellaneous scrap.

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hex	*3.45c. to 5.45c.
Squares and flats	*3.95c. to 6.95c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.
	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$10.75 to $11.00
Scrap T rails	10.00 to 10.50
Scrap girder rails	9.50 to 10.00
No. 1 railroad wrought	9.00 to 9.50
No. 1 yard wrought	8.00 to 8.50
Machine shop turnings	6.25 to 6.75
Cast iron borings (steel works and rolling mill)	6.50 to 6.60
Bundled skeleton, long	8.00 to 8.50
Forge flashings	8.50 to 9.00
Blast furnace borings and turnings	6.25 to 6.75
Forge scrap	6.50 to 7.00
Shafting	14.50 to 15.00
Steel car axles	15.50 to 16.00
Wrought pipe 1 in. in diameter (over 2 ft. long)	9.50 to 10.00
Rails for rolling	9.50 to 10.00
Cast iron borings, chemical	9.50 to 10.00
Prices per gross ton deliv'd consumers' yards:	
Textile cast	$14.00 to $14.50
No. 1 machinery cast	15.50 to 16.00
No. 2 machinery cast	13.50 to 14.00
Stove plate	10.00 to 10.50
Railroad malleable	15.00 to 15.50

Coke. — Consumers' requirements for foundry coke for the last quarter are covered. Practically all the important buyers have also covered for the first quarter. The usual amount of spot business is being done. There is a good run of orders for domestic coke. Quotations are unchanged from the $5 base for both spot and contract coke.

Old Material.—The market has become fairly stable at the prices which have prevailed for the past three weeks. Some activity is noted in all lines, but orders are largely for present needs. Shipments to mills continue active.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$10.00 to $11.00
Scrap steel rails	11.50 to 12.00
Short shoveling turnings	8.00 to 8.50
Cast iron borings	8.00
Stove plate	13.50
Steel axles	19.00 to 20.00
Iron axles	21.00 to 22.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	14.00
No. 1 cast	15.00
Tramcar wheels	13.00 to 14.00
Cast iron carwheels	13.00 to 13.50
Cast iron borings, chem	13.50 to 14.00

Canada

Structural Steel Orders Feature Markets—Large Railroad Purchases Expected Before End of Year

TORONTO, ONT., Oct. 2.—While the railroads have not placed their rail business for 1929 it is understood that large tonnages will be allotted before the end of the year. The Canadian National Railways placed orders for 55 locomotives with Canadian companies and is inquiring for five more, and is also in the market for 1500 50-ton box cars and 30 tank cars, 25 first-class coaches, two combination baggage-smoking cars and 15 sleepers.

The output of pig iron in Canada has declined somewhat from that of the high monthly average of June, but it is still greater than that of a year ago. August production amounted to 91,522 long tons, which was a slight decline from the 95,422 tons of July, but was 28,288 tons greater than that produced in August, 1927. For the eight months of this year, the total was 654,957 tons.

Pig Iron.—A rush of lagging melters to cover last quarter needs featured business in this market during the week. While tonnages involved in individual contracts were comparatively small, they totaled about 5000 tons. There are still a few who have not covered to the end of the year, but a large majority have bought. It is estimated by local blast furnace representatives that bookings for the last quarter exceed those of former quarters this year by about 15 per cent. Spot sales have continued in good volume. Radiator and sanitary ware manufacturing concerns have been extensive buyers both for spot and future delivery. While the agricultural implement industry is recognized as one of the largest consumers of pig iron in Canada, it procures practically its entire supply in the United States markets, because it has the advantage of duty-free iron. Canadian prices are strong.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$23.60
No. 2 fdy., sil. 1.75 to 2.25	23.60
Malleable	23.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	25.00
No. 2 fdy., sil. 1.75 to 2.25	25.00
Malleable	25.00
Basic	24.00
Imported Iron, Montreal Warehouse	
Summerlee	33.50
Carron	33.00

Structural Steel.—Most of the orders awarded during the past week were confined to lots under 500 tons, but two or three larger contracts were also closed and others are still pending. The Dominion Bridge Co., Montreal, reports orders for 5000 tons for the new Eaton Building in Toronto, and 6000 tons for the Dominion Square Building in Montreal. John T. Hepburn, Ltd., Toronto, has the contract to supply 500 tons of structural steel for building at University Avenue and Elm Street, Toronto. The Trussed Concrete Steel Co., Walkerville, Ont., has contract for 750 tons of steel for office building for S. E. Dinsmore, Ltd., Windsor, Ont. The Disher Steel Construction Co., Toronto, received an order for 250 tons of reinforcing bars for car barns at Oshawa, Ont., for Canadian National Electric Railways. For a new office building at Yonge and Colborne Streets, Toronto, for the Crown Life Insurance Co., about 5000 tons of steel will be required; 300 tons of reinforcing bars will be needed for the new Balfour Building, St. Lawrence Boulevard, Montreal.

Old Material. — Spot sales were strongly featured in transactions of the week. Shipping orders against old contracts, however, are appearing at regular intervals, and the movement of scrap is large. Heavy melting steel, turnings, machinery cast, wrought iron and steel axles are in the greatest demand. Prices are firm in the Toronto and Montreal markets.

Dealers' buying prices:

Per Gross Ton	Toronto	Montreal
Heavy melting steel	$9.00	$7.00
Rails, scrap	10.00	9.00
No. 1 wrought	9.00	11.00
Machine shop turnings	7.00	5.00
Boiler plate	7.00	6.00
Heavy axle turnings	7.50	6.50
Cast borings	7.50	5.00
Steel turnings	7.00	5.50
Wrought pipe	5.00	5.00
Steel axles	14.00	20.00
Axles, wrought iron	16.00	22.00
No. 1 machinery cast	....	16.00
Stove plate	....	13.00
Standard carwheels	....	16.00
Malleable	....	13.00
Per Net Ton		
No. 1 machinery cast	15.00	....
Stove plate	9.00	....
Standard carwheels	13.00	....
Malleable scrap	13.00	....

Buffalo

Pig Iron Prices Firm—Steel Mills Operating at 90 Per Cent —Scrap Prices Move Higher

BUFFALO, Oct. 2.—The steadiness of the pig iron price situation is shown by a sale of 250 tons to a district melter by a local furnace at $17.50, furnace, for No. 2X grade and at $18.50 for No. 1X. For shipment outside this immediate district, local furnaces are adhering to a $17 base for delivery during the remainder of this year and to $17.50 for first quarter. For delivery within the local territory, quotations are 50c. a ton higher both for last quarter and first quarter. Predictions of another price advance are prevalent. Inquiry now before local sellers amounts to about 2000 tons. The Hanna Furnace Co. has lighted its new stack, now having three in blast in this district. Pig iron shipments by barge canal for the week ended Sept. 29 were 900 tons.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$17.00 to $18.00
No. 2X fdy., sil. 2.25 to 2.75	17.50 to 18.50
No. 1X fdy., sil. 2.75 to 3.25	18.50 to 19.50
Malleable, sil. up to 2.25	17.50 to 18.50
Basic	17.00 to 17.50
Lake Superior charcoal	27.28

Finished Iron and Steel.—Bar, shape and plate prices are firm at 2c. to 2.10c., Buffalo. Some bars have been sold for 2.05c., Buffalo, and on small lots, 2.10c. is being obtained. Sheet business is very good at the recently established prices. A structural job amounting to 650 tons at Ithaca, N. Y., was awarded to a local fabricator. Average steel mill operation is about 90 per cent. Reinforcing bar business has tapered. Warehouse business continues to improve.

Old Material.—A large purchase of No. 1 heavy melting steel, No. 2 heavy melting steel and hydraulic compressed sheets was made during the week at $15.50 for the No. 1 grade. Between 10,000 and 15,000 tons is said to have been bought. At the same time, $16 has been paid for strictly No. 1 steel. A few sales of railroad malleable at $15.50 to $16 are re-

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-fin. flats, sq. and hex	4.45c.
Rounds	3.95c.
Cold rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$3.60
Black wire, base per 100 lb	3.75

ported, and some No. 1 machinery cast was sold at $15.25 to $15.50.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$15.50 to $16.00
No. 2 heavy melting steel	13.50 to 14.00
Scrap rails	14.50 to 15.00
Hydraulic comp. sheets	13.50 to 14.00
Hand bundled sheets	11.00 to 11.50
Drop forge flashings	13.50 to 14.00
No. 1 busheling	14.50 to 15.00
Hvy. steel axle turnings	13.00 to 13.50
Machine shop turnings	7.25 to 7.75
No. 1 railroad wrought	13.50 to 14.00
Hvy. steel axle turnings	13.00 to 13.50
Acid Open-Hearth Grades	
Knuckles and couplers	16.50 to 17.00
Coil and leaf springs	16.50 to 17.00
Rolled steel wheels	16.50 to 17.00
Low phos. billet and bloom ends	17.00 to 17.50
Electric Furnace Grades	
Short shov. steel turnings	12.00 to 12.50
Blast Furnace Grades	
Short shov. steel turnings	12.00 to 12.50
Short mixed borings and turnings	10.00 to 10.50
Cast iron borings	10.00 to 10.50
No. 2 busheling	11.00 to 11.50
Rolling Mill Grades	
Steel car axles	18.00 to 18.50
Iron axles	21.00 to 22.00
Cupola Grades	
No. 1 machinery cast	15.25 to 15.50
Stove plate	14.00 to 14.50
Locomotive grate bars	12.00 to 12.50
Steel rails, 3 ft. and under	17.00 to 17.50
Cast iron carwheels	13.00 to 13.50
Malleable Grades	
Industrial	16.00 to 16.50
Railroad	16.00 to 16.50
Agricultural	16.00 to 16.50

Detroit Scrap Market Stronger

DETROIT, Oct. 2.—Some further price advances have been registered during the past week in the scrap market in this district. Borings and short turnings and long turnings are 50c. higher. There is no sign of weakness, and dealers generally do not look for recessions from present prices in the near future.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$12.00 to $12.50
Borings and short turnings	8.50 to 9.00
Long turnings	7.50 to 8.00
No. 1 machinery cast	14.00 to 15.00
Automobile cast	19.00 to 20.50
Hydraul, comp. sheets	11.50 to 12.00
Stove plate	11.00 to 12.00
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Sheet clippings	7.50 to 8.00
Flashings	10.00 to 10.50

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†Buffalo, sil. 1.75 to 2.25	20.78
†Buffalo, sil. 2.25 to 2.75	20.78 to 21.28
East. Penn., sil. 1.75 to 2.25	23.65
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Va., sil. 1.75 to 2.25	25.71
Va., sil. 2.25 to 2.75	26.21
Ala., sil. 1.75 to 2.25	23.16 to 25.02
Ala., sil. 2.25 to 2.75	23.66 to 25.52

Freight rates: $4.91 all rail and $3.78 rail and water from Buffalo; $3.65 from eastern Pennsylvania; $5.21 all rail from Virginia; $6.91 to 8.77 from Alabama.
*All rail rate. †Rail and water rate.

Coke.—New England ovens are swamped with business. The New England Coal & Coke Co. is still behind on foundry coke deliveries, with little indication of catching up during the next fortnight. Last week's colder weather created a large demand for domestic coke. The company last week reduced its stock pile more than 2000 tons, and on Oct. 1 advanced its retail price in the Boston district from $12.50 a ton to $13. The Providence Gas Co. is slightly behind on domestic coke deliveries, but is up to date on foundry coke. Both companies quote foundry coke at $11 a ton, delivered within a $3.10 freight rate zone. On Sept. 24 the first oven of the New Haven, Conn., coke plant was pushed.

Warehouse Business.—The movement of iron and steel out of warehouses has been gathering momentum since Labor Day. Consumers are still taking conservative amounts of stock, but are buying more often. Warehouses are holding more rigidly to listed prices.

Old Material.—With liberal shipments now going to eastern Pennsylvania, while those to the Pittsburgh district are holding up well, the old material market is more active. Continued buying of scrap for export also contributes to the activity. There is a narrow market for railroad and yard wrought, but practically all other kinds of scrap are selling, and prices generally are strong, with an upward tendency. Some brokers have raised their price on heavy melting steel 25c. a ton to $11, on cars, shipping point; steel turnings and mixed borings and turnings are up 25c. to $6.75, on cars, and specification pipe is 50c. higher at $10, on cars. At least one shipper last week paid as high as $7.50 a ton, on cars, for forge scrap, but $7 appears to be the general limit. The same shipper paid $15 a ton, on cars, for shafting, which is 50c. more than most brokers have been offering. It is estimated that 10,000 tons of scrap will be exported from Boston between now and Jan. 1. On Oct. 8 the Boston & Albany Railroad will close bids on 1000 tons of No. 1 rails and miscellaneous scrap.

Warehouse Prices, f.o.b. Boston

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Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hex	*3.45c. to 5.45c.
Squares and flats	*3.95c. to 6.95c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.
	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$10.75 to $11.00
Scrap T rails	10.00 to 10.50
Scrap girder rails	9.50 to 10.00
No. 1 railroad wrought	9.00 to 9.50
No. 1 yard wrought	8.00 to 8.50
Machine shop turnings	6.25 to 6.75
Cast iron borings (steel works and rolling mill)	6.50 to 6.60
Bundled skeleton, long	8.00 to 8.50
Forge flashings	8.50 to 9.00
Blast furnace borings and turnings	6.25 to 6.75
Forge scrap	6.50 to 7.00
Shafting	14.50 to 15.00
Steel car axles	15.50 to 16.00
Wrought pipe 1 in. in diameter (over 2 ft. long)	9.50 to 10.00
Rails for rolling	9.50 to 10.00
Cast iron borings, chemical	9.50 to 10.00
Prices per gross ton deliv'd consumers' yards:	
Textile cast	$14.00 to $14.50
No. 1 machinery cast	15.50 to 16.00
No. 2 machinery cast	13.50 to 14.00
Stove plate	10.00 to 10.50
Railroad malleable	15.00 to 15.50

Cincinnati

Sheet Specifications Heavy and Prices Are Firmer—Pig Iron Quiet but Quotations Are Steady

CINCINNATI, Oct. 2.—The pig iron trade has been quiet in the past week. Most buyers have contracted for their needs until the end of the year, so that sales have been confined to small miscellaneous lots. The only sizable inquiry is from the Anderson Stove Co., Anderson, Ind., for 500 tons of foundry iron for first quarter delivery. Despite the lack of interest on the part of consumers, prices are being well maintained. Lake Erie iron is quoted at $17.50, base Cleveland, while Alabama and Tennessee furnaces are asking $16.25, base Birmingham. Practically all of the yard stocks of foundry iron at Ironton are reported to have been sold, and, since no merchant furnace is active at that point, prices are merely nominal.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$18.89 to $19.89
So. Ohio malleable	20.14 to 20.89
Ala. fdy., sil. 1.75 to 2.25	19.94
Ala. fdy., sil. 2.25 to 2.75	20.44
Tenn. fdy., sil. 1.75 to 2.25	19.94
So'th'n Ohio silvery 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—Sheet specifications booked in the past week by a large manufacturer in this district have been the largest in the history of the company and all operating units have sufficient unfilled orders to insure production at full capacity for the next two weeks or longer. The tonnage demand has been well distributed among consuming industries. The roofing season in the South is fully up to normal, and in some cases sales have exceeded the average. Sheet makers apparently are having no difficulty in maintaining prices, which have been well stabilized at 2c. to 2.10c., base Pittsburgh, for blue annealed, 4c. for automobile body, 2.75c. for black and 3.50c. to 3.60c. for galvanized. Bars, structural shapes and plates are reported to be selling at 1.95c., base Pittsburgh, to large buyers and at 2c. to small users. Fabricators have increased operations slightly, although they are having difficulty in getting enough business to sustain current production schedules. The wire market is dull. Common wire nails are bringing $2.69 per keg, delivered Cincinnati.

Coke.—A sharp upward turn in specifications for by-product foundry coke in the last two weeks of September carried shipments for the month almost 25 per cent above those of August. Colder weather has brought a better demand for domestic grades. As predicted a week ago, prices in this district will not change during October. By-product foundry coke at Detroit remains at $9, delivered to local consumers, and at $10, delivered to users outside of the Detroit switching area. Movement of beehive coke from the Wise County and New River districts has been fair. Wise County foundry coke is selling at a minimum of $4.25, ovens, and furnace coke at $3.50.

Old Material.—While shipments to consumers are holding up well, dealers have divergent opinions regarding the course of the market in the next 30 days. Quotations are unchanged. Much interest is being shown in prices which railroads will get this month for their scrap. The Big Four has a list of about 2500 tons closing today.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$12.50 to $13.00
Scrap rails for melting	13.00 to 13.50
Loose sheet clippings	9.25 to 9.75
Bundled sheets	10.00 to 10.50
Cast iron borings	8.50 to 9.00
Machine shop turnings	8.00 to 8.50
No. 1 busheling	10.50 to 11.00
No. 2 busheling	6.00 to 6.50
Rails for rolling	13.00 to 13.50
No. 1 locomotive tires	13.00 to 13.25
No. 2 railroad wrought	12.50 to 13.00
Short rails	17.00 to 17.50
Cast iron carwheels	12.00 to 12.50
No. 1 machinery cast	16.00 to 16.50
No. 1 railroad cast	13.00 to 13.50
Burnt cast	8.00 to 8.50
Stove plate	9.25 to 9.75
Brake shoes	10.25 to 10.75
Railroad malleable	12.25 to 12.75
Agricultural malleable	11.25 to 11.75

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.30c.
New billet reinforc. bars	3.15c.
Rail steel reinforc. bars	3.00c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-fin. rounds and hex	3.85c.
Squares	4.35c.
Black sheets (No. 24)	3.90c.
Galvanized sheets (No. 24)	4.75c.
Blue ann'l'd sheets (No. 10)	3.45c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 ann'l'd wire, per 100 lb	$3.00
Com. wire nails, base per keg	2.95
Cement c't'd nails, base 100 lb. keg	2.95
Chain, per 100 lb	7.55
	Net per 100 Ft.
Lap-weld. steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

Export Trade Remains Quiet

Prices Unchanged Despite Strong Domestic Market—Foreign Steel Sold Here With Difficulty

NEW YORK, Oct. 2.—Export trade continues rather small, with such foreign markets as Japan, China, Cuba and South America buying only limited quantities of steel products. Prices for export are substantially unchanged from the level of previous weeks, despite greater strength in the domestic market. Tin plate is quoted at about $5.20 per base box, c.i.f. Japanese port, and light-gage black sheets are about $76 per ton, c.i.f. Japan.

Importers of steel in New York are still disposing of small tonnages of Continental material, but at a low margin of profit, because of the high prices prevailing in Europe. Such business as has been done is attributable to the firmness of American mill prices, especially on bars. Recently 150 to 200 tons of foreign plain steel bars is reported to have been sold to a consumer here at 2.08c. per lb., duty paid. Importers are still able to offer hot-rolled hoops at about 2.40c. per lb., duty paid, for No. 18 gage, which is several dollars a ton under the domestic mill price, except in certain territories where American producers have met foreign competition.

The Government is understood to be preparing a test case on the marking of material with the country of origin, which is expected to come before the Customs Court about Oct. 17. The defendant is to be the Standard Sales Co., New York.

Final decision of the Customs Court of Appeals on the appeal of the Government from the decision of Justice Fischer classifying reinforcing bars as construction material, subject to a lower duty than plain bars, is expected about Oct. 11.

Continental Rail Prices May Be Advanced

HAMBURG, GERMANY, Sept. 15.—It is generally expected that at the next meeting of the European Rail Makers Association export prices on rails will be advanced from the present level of £6 7s. 6d. ($30.98) per ton to £6 10s. ($31.59) per ton, for eastern Asiatic markets. For all other foreign markets, except Europe, it is expected that the price will be advanced to £6 12s. 6d. ($32.20) per ton. The price to European buyers, it is believed, will be £6 15s. ($32.80) per ton. The reason given for the smaller advance to the Asiatic buyers is that higher prices might result in the loss of the Far Eastern markets to American mills.

It is announced by the United Steel Works, Düsseldorf, Germany, licensee of the American Rolling Mill Co., Middletown, Ohio, for the production of Armco products in Germany, that business in this material has developed satisfactorily. Demand is especially good for boiler plates and tubes of Armco iron. The licensee has just begun to produce Armco wire.

Non-Ferrous Metal Markets

Copper Quiet and Strong, Tin Active and Higher, Lead Steady and Unchanged, Zinc Quiet and Firm

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	Oct. 2	Oct. 1	Sept. 29	Sept. 28	Sept. 27	Sept. 26
Lake copper, New York	15.25	15.25	15.25	15.25	15.25	15.25
Electrolytic copper, N. Y.*	15.00	15.00	15.00	15.00	15.00	15.00
Straits tin, spot, N. Y.	49.75	49.95	....	49.50	49.75	49.00
Lead, New York	6.50	6.50	6.50	6.50	6.50	6.50
Lead, St. Louis	6.32½	6.32½	6.32½	6.32½	6.32½	6.32½
Zinc, New York	6.60	6.60	6.60	6.60	6.60	6.60
Zinc, St. Louis	6.25	6.25	6.25	6.25	6.25	6.25

*Refinery quotation; delivered price ¼c. higher.

Copper.—September set a new record in total sales at close to 250,000 net tons, according to reliable estimates. Between 145,000 and 150,000 tons was for domestic consumption. The foreign sales at about 100,000 tons, while very large, did not equal by about 5000 tons the heavy transactions last May. Domestic buying extended as far ahead as December and it is generally admitted that consumers have bought all their October and November requirements and at least 75 per cent of those for December. If the amount probably bought in excess of requirements for October-November is recognized, it is probable that domestic needs for the rest of the year are well provided for. Foreign consumers must still buy about one-third of their October normal requirements, about two-thirds of their November needs and considerable for December. Quotations are unchanged at the recent advance, with electrolytic selling at 15.25c., delivered in the Connecticut Valley, and at 15.50c., c.i.f. European ports, which is the official quotation of Copper Exporters, Inc. As the month opens, the market is naturally quiet and will probably continue so for some little time, although foreign buying may be somewhat active. On Oct. 1, mining companies advanced the wages of their miners 10 per cent, which is estimated to increase the cost of refined copper from ⅜c. to ½c. per lb. This has been taken care of in the recent advances in the price of refined metal. Lake copper is moderately active and strong at 15.25c., delivered.

Copper Averages.—The average price of Lake copper for September, based on daily quotations in THE IRON AGE, was 14.95c., delivered. The average price of electrolytic copper was 14.70c., refinery, or 14.95c., delivered in the Connecticut valley.

Tin.—Because of strong manipulation in London, which has tended to cause excitement in the New York market, sales have been large to both consumers and dealers. For the week ended Saturday, Sept. 29, about 2000 tons changed hands, making the total for the last 10 weeks about 10,000 tons. Sales last week included deliveries all the way from spot to January and February. Flotation of mining shares in London is said to have pushed the market up in the last few days. Business this week, Monday and Tuesday, has been moderately active with spot Straits tin quoted Tuesday at 49.75c., New York, the highest since early in June. Prices in

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	51.00c. to 52.00c.
Tin, bars	53.00c. to 54.00c.
Copper, Lake	16.25c.
Copper, electrolytic	16.00c.
Copper, casting	15.25c.
Zinc, slab	7.25c. to 7.75c.
Lead, American pig	7.50c. to 8.00c.
Lead, bar	9.25c. to 10.25c.
Antimony, Asiatic	13.25c. to 13.75c.
Aluminum No. 1 ingots for remelting (guar'nt'd over 99% pure)	25.00c. to 26.00c.
Alum. ingots, No. 12 alloy	24.00c. to 25.00c.
Babbitt metal, commerc'l grade,	30.00c. to 40.00c.
Solder, ½ and ½	32.75c. to 33.75c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	55.00c.
Tin, bar	57.00c.
Copper, Lake	16.00c.
Copper, electrolytic	16.00c.
Copper, casting	15.25c.
Zinc, slab	8.00c.
Lead, American pig	7.00c. to 7.25c.
Lead, bar	9.50c.
Antimony, Asiatic	16.00c.
Babbitt metal, medium grade	18.75c.
Babbitt metal, high grade	59.00c.
Solder, ½ and ½	32.75c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	19.75c.
Copper, hot rolled	24.50c.
Copper, cold rolled, 14 oz. and heavier	26.25c.
Seamless Tubes—	
Brass	24.62½c.
Copper	25.50c.
Brazed Brass Tubes	27.75c.
Brass Rods	17.50c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.00c. to 10.50c.
Zinc sheets, open	11.00c. to 11.50c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products have not been changed since the advance of Sept. 24. Zinc sheets are quoted at 9.75c., base, and lead full sheets at 10c. to 10.25c.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	19.75c.
Copper, hot rolled	24.00c.
Zinc	9.75c.
Lead (full sheets)	10.00c. to 10.25c.
Seamless Tubes—	
High brass	24.62½c.
Copper	25.50c.
Rods—	
High brass	17.50c.
Naval brass	20.25c.
Wire—	
Copper	17.25c.
High brass	20.25c.
Copper in Rolls	23.00c.
Brazed Brass Tubing	27.75c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machine rods	34.00c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged customers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	12.75c.	14.25c.
Copper, hvy. and wire	12.50c.	13.50c.
Copper, light and bottoms	11.00c.	12.00c.
Brass, heavy	7.25c.	8.25c.
Brass, light	6.25c.	7.25c.
Hvy. machine composition	9.75c.	11.00c.
No. 1 yel. brass turnings	9.00c.	9.625c.
No. 1 red brass or compos. turnings	9.00c.	10.00c.
Lead, heavy	5.25c.	5.625c.
Lead, tea	3.75c.	4.25c.
Zinc	3.25c.	3.625c.
Sheet aluminum	12.50c.	14.50c.
Cast aluminum	11.75c.	13.50c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Consumers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	19.75c.
Copper, hot rolled	24.00c.
Copper, cold rolled, 14 oz. and heavier	26.25c.
Zinc	10.00c.
Lead, wide	9.75c.
Seamless Tubes—	
Brass	26.12½c.
Copper	27.00c.
Brass Rods	17.50c.
Brazed Brass Tubes	27.75c.

London Tuesday were higher than a week ago, with spot standard quoted at £224, future standard at £220 17s. 6d. and spot Straits at £224 10s. The Singapore price was £225 10s., up nearly £4 in the week. Statistics for September did not create a favorable impression. Shipments from the Straits were 8310 tons, with Banca shipments at 1717 tons, both larger than expected. American deliveries into consumption were 6685 tons, which was well below estimates. There was an increase in the world's visible supply of 1468 tons, bringing the total on Oct. 1 to 19,924 tons.

Lead.—Business continues in satisfactory proportions, and prices are unchanged and strong. In the outside market, quotations stand at 6.32½c., St. Louis, for October, and 6.35c. for November. The leading interest continues to quote 6.50c., New York, as its contract price.

Zinc.—Extreme quietness pervades the market, but prices continue firm and unchanged at 6.25c., East St. Louis, or 6.60c., New York. Production of ore in the Joplin district was high last week at about 10,500 tons, but it is expected every fourth week the output will be decidedly curtailed.

Antimony. — Because of curtailed stocks here and a fairly active demand for the metal, Chinese antimony is higher at 11.50c., New York, duty paid for spot and 10.87½c. to 11c., for future.

Nickel. — Wholesale lots of ingot nickel are quoted at 35c. with shot nickel at 36c. and electrolytic at 37c. per lb.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 23.90c. per lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, Oct. 2.—Sales of copper for immediate use are larger and prices have advanced. Quotations on tin are higher under the influence of foreign markets. The old metal market shows a more quiet tone but prices are unchanged.

Prices, per lb., in carload lots: Lake copper, 15.50c.; tin, 51.50c.; lead, 6.45c.; zinc, 6.35c. in less-than-carload lots; antimony, 12c. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.75c.; red brass, 9.50c.; yellow brass, 7.25c.; lead pipe, 4.75c.; zinc, 3.50c.; pewter, No. 1, 30c.; tin foil, 36.25c.; block tin, 45.25c.; aluminum, 12c., all being dealers' prices for less-than-carload lots.

Reinforcing Steel

Awards of 8100 Tons—1800 Tons in New Work

AWARDS of 8100 tons, reported to THE IRON AGE during the last week, included 1400 tons for a garage in New York. New projects, calling for only 1800 tons, included no jobs of outstanding size. Awards follow:

WORCESTER, MASS., 400 tons, telephone building, to Jones & Laughlin Steel Corporation.

WALTHAM, MASS., 100 tons, State hospital, to Barker Steel Co.

NEW YORK, 1400 tons, Packard garage and service station, to Jones & Laughlin Steel Corporation.

NEW YORK, 500 tons, two sections of subway; 100 tons in section 5-B, route 109, from Cornell Contracting Corporation, and 400 tons in section 1, route 106, from George H. Flinn Corporation, to McClintic-Marshall Co.

NEW YORK, 550 tons, Government barracks on Governor's Island; from James McWilliams, general contractor, to Igoe Brothers.

JONES BEACH, N. Y., 850 tons, causeway; from C. H. Earle, general contractor, to E. T. Edwards, Columbia, Pa.

ALBANY, N. Y., 340 tons, Alcove dam, to McClintic-Marshall Co.

RED BANK, N. J., 100 tons, sewage disposal plant, to Igoe Brothers.

RUTHERFORD, N. J., 100 tons, Erie Railroad bridge, to McClintic-Marshall Co.

KNOXVILLE, TENN., 150 tons, science building, to Connors Steel Co.

NEW ORLEANS, 450 tons, McDonough School, to Connors Steel Co., Birmingham.

MOBILE, ALA., 120 tons, Fowl River bridge, to Connors Steel Co.

HUNTSVILLE, ALA., 175 tons, Russell Erskine Hotel, to Connors Steel Co.

JACKSONVILLE, FLA., 100 tons, Jacksonville Title & Trust Co. building, to Connors Steel Co.

STICKNEY, ILL., 600 tons, construction work for Sanitary District, to Barton Spiderweb System, Inc.

CHICAGO, 140 tons of rail steel bars, garage, to Concrete Steel Co.

CHICAGO, 200 tons, building for Commonwealth Edison Co., to Olney J. Dean & Co.

CHICAGO, 200 tons, apartment hotel, awarded by Gamm Construction Co. to an unnamed bidder.

CHICAGO, 600 tons of rail steel bars, building at 4940 East End Avenue, to Calumet Steel Co.

HIGHLAND PARK, ILL., 100 tons, Moraine Hotel, to Concrete Engineering Co.

EVANSTON, ILL., tonnage not stated, store and apartment building for Victor C. Carlson, to Kalman Steel Co.

STATE OF ILLINOIS, 300 tons of rail steel bars, State road work, to Calumet Steel Co.

SEATTLE, WASH., 100 tons, three small jobs, to Northwest Steel Rolling Mills.

SAN FRANCISCO, 500 tons, Great Western Power Co. plant at India Basin, to Pacific Coast Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

ASBURY PARK, N. J., 300 tons, convention hall; Turner Construction Co., general contractor.

WASHINGTON, 450 tons, Arlington Memorial Bridge.

CHICAGO, tonnage not stated, apartment building at 4728 East End Avenue.

CHICAGO, 225 tons, apartment building at 5912 Commonwealth Avenue; Olsen & Urbain, architects.

CHICAGO, 100 tons, apartment building at 3021 Washington Boulevard; E. F. Bahrens, architect.

OAK PARK, ILL., tonnage not stated, four-story office and store building; Holabird & Root, architects.

FORT LEWIS, WASH., 575 tons, three Government buildings; Chrisman & Snyder, general contractors.

LOS ANGELES, 170 tons, apartment building, Ninth and Union Streets; bids being taken.

Obituary

GEORGE D. MCILVAINE, formerly secretary of the National Pipe and Supplies Association and of the Enameled Sanitary Ware Manufacturers Association, died in Pittsburgh, Sept. 28. He had long been prominent in trade association work, and in recognition of his efforts in this direction, was elected one of the early presidents of the American Trade Association, an organization composed of executives of trade associations. Born in Chambersburg, Pa., 58 years ago, he was graduated with the class of 1889 from Lafayette College, of which he later became a trustee. Ill health forced him to relinquish his secretaryship of the pipe and supplies and the sanitary ware associations a few years ago, but he was elected honorary secretary of both organizations. He also was secretary of the American Shovel Institute and the Forged Tool Society.

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FRED I. TEALE, sales representative of Eaton, Rhodes & Co., Cincinnati, pig iron and coke dealers, died at his home in Norwood, Ohio, Sept. 28, after a two months' illness. He was one of the best known salesmen in the southern Ohio pig iron trade. For many years he was associated with Rogers, Brown & Co., first at Buffalo and later at Cincinnati. Shortly after Rogers, Brown & Co. and Crocker Brothers consolidated, Mr. Teale was appointed resident agent at Cincinnati for the M. A. Hanna Co. Recently he resigned this position to become connected with Eaton, Rhodes & Co.

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J. C. YARNELL, for 17 years Western sales manager at Detroit for the Clark Brothers Bolt Co., Milldale, Conn., died suddenly at Kalamazoo, Mich., on Sept. 25. Prior to his connection with the bolt industry, Mr. Yarnell had been engaged in the wagon and carriage spring business.

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JAMES PARKER, president Kitts Mfg. Co., Oswego, N. Y., maker of steam specialities, died at his home in that city on Sept. 23, aged 62 years.

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THOMAS R. TIMOTHY, manager Chester works, American Sheet & Tin Plate Co., Chester, W. Va., died at St. Francis Hospital, Pittsburgh, Sept. 27. He was born at Leechburg, Pa., 52 years ago and had been identified with the company for 35 years, starting as sweeper in the mill at Leechburg and serving as a hot mill foreman at the Cambridge and Martins Ferry, Ohio, works of the company before his promotion 16 years ago to the managership of the Chester works.

Horace T. Potts & Co., Philadelphia, have sold an acre of ground at the extreme east of their warehouse property in North Philadelphia to the International Harvester Co., which is expected to erect a service station for trucks.

PERSONAL

E. F. SCOTT, who has been engineer on layout, design and equipment of foundries for the Austin Co., Cleveland, has been appointed secretary-manager of the Ohio Foundries Association, Inc., succeeding ARTHUR J. TUSCANY, who recently became manager of the Gray Iron Institute.

E. F. SCOTT

Mr. Scott has been in close contact with the foundry industry for several years in engineering and sales work and has also devoted a great deal of attention to the business problems of the foundry. He is a member of the American Foundrymen's Association and has written texts and papers on subjects relating to some of the technical problems of the foundry industry. He assumed his new position Oct. 1, with headquarters in Cleveland.

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FRANK HURD, formerly superintendent of the Gadsden and Sheffield, Ala., furnaces of the Sloss-Sheffield Steel & Iron Co., Birmingham, has been made superintendent of the Vanderbilt furnaces of the Woodward Iron Co. at Vanderbilt, Ala.

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GEORGE L. BITTING, director of sales Bunting Brass & Bronze Co., Toledo, has tendered his resignation, effective immediately. He has announced no specific plans for the future.

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A. M. LYMAN, for 15 years identified with the sales department of the American Cast Iron Pipe Co., Birmingham, has become associated with the sales organization of the Birmingham Foundry & Machine Co., Birmingham.

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B. W. ROGERS has been appointed representative at Akron, Ohio, for the Falk Corporation, Milwaukee, and will have headquarters at 225 Central Savings & Trust Building. He has recently been identified with the B. F. Goodrich Co. in that city and previously was associated with the Allis-Chalmers Mfg. Co.

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J. A. WRIGHT has resigned as sales manager National Cast Iron Pipe Co., Birmingham, and is devoting his time to private business interests at Pensacola, Fla.

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D. WALKER WEAR has been elected president of the Stowe Mfg. Co., Binghamton, N. Y., succeeding the late CHARLES F. HOTCHKISS.

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ARTHUR C. TOZZER, vice-president Turner Construction Co., in charge of the Boston territory, has been elected executive vice-president of the company, with headquarters at the main office, 420 Lexington Avenue, New York. WILLIAM H. NYE, who has been Boston contract manager, has been named to succeed Mr. Tozzer as vice-president in charge of the Boston office, 178 Tremont Street.

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L. S. MONROE has resigned as advertising manager Electric Controller & Mfg. Co., Cleveland, to become associated with the Copperweld Steel Co., Glassport, Pa.

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ARTHUR F. SCHERER, Cincinnati district sales manager Wheeling Steel Corporation, has resigned, and HU-

H. B. MILLER

BERT B. MILLER, for the past year in the Detroit district sales office, has been named to succeed him. Mr. Scherer has been associated with the Wheeling corporation or its subsidiaries for the past 16 years. He intends to enjoy a long period of rest on the Pacific Coast. Mr. Miller has been engaged in the steel business for 21 years. Starting in 1907 as clerk with the Otis Steel Co., he was elected secretary of that company in 1919, and resigned that position in March, 1927, to go with the Wheeling Steel Corporation.

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A. V. WILLGOOS, chief engineer of the Pratt & Whitney Aircraft Corporation, Hartford, Conn., gave an illustrated talk on engines manufactured by his company, at a meeting of the New Britain, Conn., section of the American Society of Mechanical Engineers on Sept. 27. He will address the Boston section this month on the same subject.

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H. E. CHILCOAT, who has been engaged in consulting commercial engi-

H. E. CHILCOAT

neering work since 1926, has been appointed manager of sales for the air dump car division, Koppel Industrial Car & Equipment Co., Pittsburgh. He began his business career in 1900 in the employ of the Pennsylvania Railroad. In 1906 he became associated with the Westinghouse Air Brake Co. as traveling inspector, with headquarters at Richmond, Va. Later he was transferred to the company's sales department at Pittsburgh, continuing in sales work until 1918. He then resigned to become manager of the Clark Car Co., Pittsburgh, holding that position until 1926.

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PROF. FRANK P. MCKIBBEN, consulting structural and bridge engineer, will lecture before various engineering societies throughout the country during the winter on the application of electric arc welding to the noiseless construction of buildings, based upon the experience of the General Electric Co. and other companies. On Oct. 4, Professor McKibben will speak before the Rochester (N. Y.) Engineering Society, and on Oct. 11 at the fall meeting of the American Welding Society.

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P. A. TERRELL, formerly manager of the new industries division of the Mississippi Power Co., has taken

charge of central station and railroad sales for the Copperweld Steel Co., Chicago. He was graduated in electrical engineering from the Alabama Polytechnic Institute in 1917 and spent the following nine months on the General Electric Co. test course at Schenectady, N. Y. After serving in the Marine Corps during the war, he joined the Alabama Power Co., remaining with it until May, 1927, when he became identified with the Mississippi company.

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F. H. WILLCOX and L. E. L. THOMAS, vice-presidents, and GORDON FOX, electrical engineer, of the Freyn Engineering Co., Chicago, returned Sept. 18 from a four months' business trip to Russia, where this company is constructing two steel mill units for the Soviet Government.

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A. H. TISCHER has been appointed representative in southern and central Indiana and Louisville, Ky., for the Foote Brothers Gear & Machine Co., Chicago, and will have headquarters at 704 North Alabama Street, Indianapolis.

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A. J. FORSCHNER, who in July of this year was appointed vice-president of the Atlas Conveyor Co., 20 South Fifteenth Street, Philadelphia, has also taken over the duties of secretary of the company. In this capacity he succeeds E. A. THUMLERT, who left the company Aug. 6.

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JOHN M. WATSON, SR., has resigned as general manager of the Canonsburg Steel & Iron Works, Canonsburg, Pa. He had been associated with the company for 27 years. D. M. STEMBLE has been elected vice-president and general manager.

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J. B. JOHNSON, chief of the material branch of the United States Air Corps, McCook Field, Dayton, Ohio, will speak Oct. 4 before the Cincinnati chapter of the American Society for Steel Treating on "The Application of Metallurgy in Aircraft Production."

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NORMAN F. MELVILLE has resigned as manager of metallurgy and inspection for the Superior Steel Corporation, Pittsburgh. He had been with the Columbia Steel Co. at both its Elyria, Ohio, and Butler, Pa., plants.

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E. J. KULAS, president Otis Steel Co., Cleveland, sailed Sept. 28 for a several weeks' trip through Europe.

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F. A. BUCHDEA has been elected vice-president, and H. C. STUCESSEY, treasurer, of the Eaton Axle & Spring Co., Cleveland. They were formerly treasurer and assistant treasurer respectively.

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J. R. GORMAN has been elected vice-president and general manager of the Transue & Williams Steel Forging Corporation, Alliance, Ohio, and HAROLD O. BARKER, a partner in the banking house of Jesup & Lamont, New York, has been elected chairman of the board. Mr. Barker became interested in the company about a year ago and in the spring was elected a director and became chairman of the executive committee. He has also been elected chairman of the Murray Body Corporation, Detroit.

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F. R. FISHBACK, president Electric Controller & Mfg. Co., Cleveland, has been elected vice-president in charge of the apparatus division of the National Electrical Manufacturers' Association, of which ALFRED E. WALLER is managing director. He was elected by the executive committee of the board of governors to replace N. A. WOLCOTT, resigned. Mr. Fishback was formerly sales manager of the Electric Controller company but was made vice-president and secretary of that company in 1924 and the following year was elected president. As vice-president of the apparatus division of the N. E. M. A., he will represent a group which includes about 85 per cent of all the manufacturers of electrical apparatus and machinery in the country.

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FRED A. DOOLITTLE has been appointed field representative in the Central States for the Gray Iron Institute, Cleveland. He has had considerable contact with organization activities and a broad experience in personnel work. For four years he was membership secretary of the American Plan Association in Cleveland. For the past year he has been engaged in forming an association of apartment house owners in Cleveland. During the war he served as captain in the regular army and spent his time in organizing personnel departments in the Eastern territory and in assisting in settling labor disputes in arsenals and navy yards.

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R. K. WEBER has been elected president of the Mount Vernon Car Mfg. Co., Mount Vernon, Ill., succeeding the late W. C. Arthur. H. H. CUST has been made vice-president, succeeding Mr. Weber.

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ALOYSE MEYER, president of the International Steel Cartel, the European association which includes all the important steel producing countries of the Continent, arrived recently in New York and has started on a trip to the centers of steel production in the United States. Mr. Meyer has been president of the cartel for about one year, having been selected as its head as president of one of the largest European steel companies, the Acieries Reunies de Burbach-Eich-Dudelange in Luxemburg. He expects to return to New York in time to attend the meeting of the American Iron and Steel Institute, Oct. 26.

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CHARLES WARDLOW, managing director of S. & C. Wardlow, Ltd., Sheffield, England, maker of cutlery sheets and file steel, will arrive in this country next week to visit A. Milne & Co., 745 Washington Street, New York, the firm's agent for the United States and Canada.

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GEORGE H. CHARLS, president National Association of Flat Rolled Steel Manufacturers, will address the meeting of the Pressed Metal Institute to be held in Buffalo, on Friday afternoon, Oct. 12.

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TERRENCE HANLON, formerly associated with the Pennsylvania Wood & Iron Co., Buffalo, has been placed in charge of an office which has been opened at 602 Genesee Building, Buffalo, by the Hausman & Wimmer Co., Pittsburgh, dealer in steel and iron and steel scrap. EDWARD R. JONES, recently with the Rochester Iron & Metal Co., Rochester, N. Y., is associated with Mr. Hanlon.

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L. C. WILSON, for eight years vice-president and general manager of the Federal Malleable Co., West Allis, Wis., has been appointed assistant to PAUL LLEWELLYN, president Interstate Iron & Steel Co., Chicago.

—

L. DUDLEY CARR has been appointed assistant superintendent of the Auburn, N. Y., works of the International Harvester Co. He succeeds ADELBERT P. JONES, who has been made superintendent of the company's Canton, Ill., plant.

—

WILBUR F. HELMER, formerly chief engineer of the F. L. Hughes Co., Rochester, N. Y., has been made general manager of the Utica Structural Steel Corporation, Utica, N. Y., recently formed as a reorganization of the Andrews Iron & Steel Corporation. He replaces GEORGE W. ANDREWS, who was general manager of the Andrews corporation. The company plans an addition to its East Utica plant.

—

F. H. MOYER has been elected president of the Mackintosh Hemphill Co., Pittsburgh. He has been identified with this company for the past two years, most of the time as executive vice-president.

—

H. C. WEIDNER, general manager Townsend Co., New Brighton, Pa., has been elected president, succeeding the late R. T. TOWNSEND. Mr. Weidner has been with the Townsend organization for 15 years and has been active in the bolt, nut and rivet industry for 28 years. Before becoming general manager, he was for several years general sales manager.

Debevoise-Anderson Co., pig iron, coke and coal, has moved from 114 Liberty Street to suite 1201, 117 Liberty Street, New York.

IRON AGE

Tin Plate Agreement Runs Three Years

Plan Effective Now Expected to Increase Welsh Exports—Wage and Freight Advances in Germany May Raise Steel Prices

(By Cable)

CLEVELAND pig iron is still quiet, especially for export, and consumers are looking for lower prices, but makers are maintaining a firm market. Hematite iron is active both at home and for export and stocks have considerably diminished so that prices are steadier. Foreign ore continues quiet.

Finished steel is active in the domestic market, but is generally quiet in export trade. Cammell, Laird & Co., Ltd., has secured a contract for one vessel of 12,000 tons for the Blue Star Line. Workman, Clark & Co. of Belfast are to build six 9000-ton vessels for Andrew Weir & Co., which enables them to resume operations at their south yard, which has been closed since the old company disbanded. The contract for a dockyard at Singapore has been placed by the Admiralty with Sir John Jackson, Ltd., of London. The work is to be completed within 7 years.

Welsh tin plate bar makers are booked with good orders from the Welsh tin plate mills. Tin plate is moderately active with forward sales at 18s. 3d. ($4.43) per base box, f.o.b. works port. Consumer interest is increasing. The Welsh-United States agreement on tin plate operates for three years from Oct. 1.

Galvanized sheets are strong as a result of makers' well sold order books and the substantial strength of Continental steel prices. Japan has been a steady buyer of light gage black sheets and makers are sold up to the end of the year.

Continental iron and steel prices are strong, with continued export demand and makers well booked with orders. Belgian output in August was 329,000 tons of pig iron and 332,000 tons of steel.

Tin Plate Agreement Aids Welsh

Mills May Increase Exports by 1,000,000 Boxes Annually—British Heavy Rolled Products Still Quiet

LONDON, ENGLAND, Sept. 18.—Interest in the iron and steel market recently has centered in the negotiations just concluded between United States and Welsh tin plate makers for the elimination of unnecessary export competition. Precise details of the scheme are still lacking, pending the return from the United States next week of representatives of Welsh producers. Meanwhile it has been disclosed that sections of certain overseas markets are to be reserved for United States manufacturers, particularly those in which America has large capital investments, and in return Welsh mills will have a free hand in other markets, probably throughout Europe.

Taking the exports of the two nations as 100 per cent, Wales will receive a quota of 70 per cent and the United States 30 per cent, so that Welsh makers will have a possible outlet for an additional 1,000,000 base boxes a year. With the announcement of these negotiations an optimistic tone prevails in Wales, and makers are looking forward to a period of prosperity. Their order books from October to the end of December are well filled, and some have made sales into next year. Consumers realize that the period of low prices on tin plate is ended unless there is a decided decline in the cost of production. But the cost of Continental steel has increased greatly, and Welsh steel makers are beginning to profit from that situation.

The tone of the iron and steel business as a whole has improved. Although the number of British furnaces in blast at the end of August, 130, was small, demand for pig iron shows signs of revival, consumers being more inclined to consider their winter requirements. In the domestic market British makers are holding their own, but abroad they still encounter strong competition in some quarters.

In finished products, mills engaged in the production of light material are busy and likely to continue so for a considerable period of time. Cer-

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' work with American equivalent figured at $4.86 per £ as follows:

Durham coke, del'd	£0	17½s.				$4.25		
Bilbao Rubio ore*	1	2	to £1	2½s.		5.35	to	$5.48
Cleveland No. 1 fdy	3	8½	to 3	9½		16.64	to	16.89
Cleveland No. 3 fdy	3	6				16.04		
Cleveland No. 4 fdy	3	5				15.80		
Cleveland No. 4 forge	3	4½				15.68		
Cleveland basic (nom.)	3	5				15.80		
East Coast mixed	3	10				17.11		
East Coast hematite	3	10½				17.23		
Rails, 60 lb. and up	7	15	to 8	5		37.66	to	40.10
Billets	6	2½	to 6	15		29.77	to	32.81
Ferromanganese	13	15				66.83		
Ferromanganese (export)	14	0				68.04		
Sheet and tin plate bars, Welsh	6	0				29.16		
Tin plate, base box	0	18	to 0	18¼		4.37	to	4.43
Black sheets, Japanese specifications	13	7½				65.00		
						C. per Lb.		
Ship plates	7	12½	to 8	2½		1.63	to	1.74
Boiler plates	9	0	to 10	10		1.92	to	2.25
Tees	8	2½	to 8	12½		1.74	to	1.84
Channels	7	7½	to 7	17½		1.58	to	1.69
Beams	7	2½	to 7	12½		1.53	to	1.63
Round oars, ¾ to 3 in.	7	5	to 7	15		1.55	to	1.66
Steel hoops	9	0	to 10	0		1.92	to	2.14
Black sheets, 24 gage	9	15	to 10	0		2.09	to	2.14
Galv. sheets, 24 gage	13	10	to 13	15		2.93	to	2.98
Cold rolled steel strip, 20 gage, nom.	16	0				3.42		

*Ex-ship, Tees, nominal.

Continental Prices All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron (a):								
Belgium	£3	3s.	to £3	5s.		$15.31	to	$15.80
France	3	3	to 3	5		15.31	to	15.80
Luxemburg	3	3	to 3	5		15.31	to	15.80
Basic pig iron (nom.):								
Belgium	3	3	to 3	4		15.31	to	15.55
France	3	3	to 3	4		15.31	to	15.55
Luxemburg	3	3	to 3	4		15.31	to	15.55
Coke	0	18				4.37		
Billets:								
Belgium	5	2				24.79		
France	5	2				24.79		
Merchant bars:						C. per Lb.		
Belgium	6	7½				1.40		
France	6	7½				1.40		
Luxemburg	6	7½				1.40		
Joists (beams):								
Belgium	5	5				1.14		
France	5	5				1.14		
Luxemburg	5	5				1.14		
Angles:								
Belgium	6	0				1.30		
¼-in. plate:								
Belgium (a)	6	15				1.50		
Germany (a)	6	15				1.50		
⅜-in. ship plate:								
Belgium	6	10				1.44		
Luxemburg	6	10				1.44		
Sheets, heavy:								
Belgium	6	1				1.33		
Germany	6	1				1.33		

(a) Nominal.

tain sections of the heavier industries, such as the construction and engineering branches, are well occupied, but there is still not enough tonnage for the heavy plate mills and some plants are obliged to operate alternate weeks. New shipbuilding is improving, but the volume of tonnage coming to the steel makers is not sufficient to compensate for the lack of export demand. Except for specialties, such as tin plate and galvanized sheets, export business in finished iron and steel is on a very small scale.

Belgian Industry and Finance Is Sound

British Official Publication Reviews Economic Situation of Iron and Steel and Metal Working

BELGIAN anxiety about the commercial depression which it was supposed would follow the currency stabilization during October, 1926, has not been justified, according to a "Report on the Economic Situation in Belgium," written at the end of 1927 and just published by the British Department of Overseas Trade. The British coal strike, and the rise of French and Italian currency presented some unexpected markets for Belgian products at the end of 1926. These aids were temporary, yet the trade balance has steadily improved so that at the beginning of 1928 gold was being shipped from United States to Belgium, the budget showed a comfortable surplus, and large reductions had been made in the national debt.

Cartels and amalgamations have been formed in many industries, including metallurgical, automobile and railroad supply. Another noteworthy trend is the production of finished products rather than the exportation of crude materials. Machinery manufacture is one of the few industries showing an unsatisfactory condition. Employment is high: only 1.7 per cent of all industrial workers are totally unemployed; 3.8 are partially employed. Such labor troubles as have arisen have been rapidly adjusted. Due to the restricted purchasing power of the currency and the special taxes imposed for the period 1926-1930, Belgian imports are restricted, but the report concludes that in view of the general healthy condition of all the country, commercial prospects are distinctly favorable.

Narrow Profit in Iron and Steel

Turning specifically to the iron and steel trade, the report notes that operations during the first quarter of 1927 were conducted at a narrow margin of profit, except on the part of one or two of the leading interests. Competition was keen with Germany, Luxemburg and especially France, and the trade from the Far East, India and South America was abnormally small and did not improve until the middle of the year. On account of a limited home market, Belgian producers are said to be more dependent upon exports than steel makers in other countries.

The following associations or cartels were formed during the year:

Product	Scope	Expiration Date
Wire	Germany, France, Belgium, Luxemburg	June 30, 1928
Bolts and nuts	Belgium	
Machinery	Belgium	
Pig iron	France, Belgium, Luxemburg	Jan. 1, 1929
Tubes	International	

Wages were increased 2½ per cent on Feb. 1, 1927. Two hundred and three thousand one hundred and forty-three persons are engaged in the metallurgical industry, according to the census on Oct. 1, 1926, that counted 1,080,331 engaged in all industrial establishments employing 10 or more workers.

As above noted, trade in miscellaneous machinery is very unsatisfactory, due to high tariffs in most importing countries and sharp competition by England and Germany. In 1891 7295 workmen were employed in the machinery industry, while in October, 1927, the number had dropped to 4235. As a consequence increased specialization of producing plants is clearly recognizable.

Steady expansion in the motor car industry is noted. Some 7000 machinists and 7400 carriage workers are employed, and in 1927 they produced about 1000 trucks and 5000 passenger automobiles. The most progress is in heavy buses for interurban transport. Various mergers and liquidations seem to indicate the evolution of an all-Belgian standard chassis, especially adapted to the nation's peculiar road requirements. Differentiation would therefore be limited to engines and bodies.

Firearm Factories Stagnant

The great industry in firearms centering at Liege is stagnant, due to customs and police regulations in most importing countries. Whereas in 1913 some 1,370,000 weapons were proofed by the official testing board, the number dropped to 550,000 in 1926. Automatic pistols and breech-loading shotguns showed the least decline.

In the Grand Duchy of Luxemburg the important iron industry has been handicapped by preferential railroad rates granted to Belgian producers, two increases in wages, compulsory charges for social welfare purposes, and slowly declining pig iron prices. The international cartel did not bring the expected results, but two of the principal producers have amalgamated, and a cooperative society of all pig iron makers has been formed to make international arrangements and allocate the orders. The net results of these handicaps and helps has been capacity furnace operation and a 9 per cent increase in both iron and steel production over 1926.

Belgian Prices Are Strong

Mills Offer Deliveries Into January and Are Unable to Accept All Sizes—Export Trade Improving

ANTWERP, BELGIUM, Sept. 15.—Mills are still fully engaged and prices are strong, having advanced further on some products, particularly beams and rods. Considerable business is being booked and many orders are of good size. Export demand is good, with a steady volume of trade from Japan and India and increased interest shown by Chinese buyers.

More active demand from foreign consumers of steel has apparently been caused in part by the independent position of most Continental mills. French producers are firm in their quotations and not actively seeking new business. German sellers are either out of the market temporarily or quoting further advances in prices. As a result, buyers seem to be willing to accept quoted prices without making any serious attempt to secure concessions. In most cases, mills are unable to accept all sizes, so that when a range of sizes is ordered the buyer often finds it necessary to divide the business. Deliveries extend through December and even into January on the small sizes of bars and rods.

Semi-Finished Material.—Prices are strong and show a continued tendency to advance. Business in blooms is small, because of the lack of available supplies. Prices range from £4 9s. ($21.63) per metric ton for 8-in. to £4 16s. ($23.33) per ton for 4-in. blooms. Billets are offered only occasionally and quotations are nominal at £4 17s. ($23.57) per ton for 3-in. and £4 18s. 6d. ($23.93) for 2-in. billets. Demand for sheet bars is good, but supplies are small. For a nominal assortment £5 ($24.30) per ton is being asked by sellers. All these quotations are f.o.b. Antwerp.

Pig Iron.—Business is satisfactory and prices are firm, especially for export. Quotations now range up to £3 5s. ($15.80) per ton, f.o.b. Antwerp, for No. 3 phosphoric foundry iron. The domestic price continues unchanged at 117 Belgas ($16.25), f.o.b. furnace. Thomas steel-making iron is quoted at £3 1s. to £3 3s. ($14.82 to $15.31) per ton, f.o.b. Antwerp, for export and at 115 Belgas ($15.97) per ton in the domestic market. Bessemer hematite is offered at $18, furnace, to meet the competition of the British product.

Finished Material.—Demand is con-

siderably in excess of the available supply of material, and mills are fully booked with tonnage for the next two or three months. Deliveries, in some cases, extend into January on small sizes of bars, rods and beams. With many makers unable to accept any but certain sizes on which rolling schedules are not completed, prices are firm and size extras are fully maintained. Quotations for steel bars are £6 2s. 6d. to £6 3s. per ton (1.35c. to 1.36c. per lb.), and £6 5s. per ton (1.37c. per lb.) is obtained occasionally for special specifications or prompt shipment. German mills are asking £6 5s. per ton (1.37c. per lb.) rather generally, but are usually able to accept any sizes specified and offer earlier delivery than Belgian makers. Beams are quoted at £5 per ton (1.10c. per lb.), f.o.b. Antwerp, and hot-rolled hoops, at £7 2s. 6d. per ton (1.57c. per lb.). Corrugated reinforcing bars are about £6 6s. per ton (1.39c. per lb.), f.o.b. Antwerp.

German Domestic Sales Better

Expected Price Advance Based on Freight and Wage Increases Brings Buying Movement

BERLIN, GERMANY, Sept. 17.—Rhenish-Westphalian experts calculate that the 11 per cent increase in railroad freight rates, which becomes effective Oct. 1, will involve an increase in steel production cost of between 1.50 and 2 m. (35c. and 50c.) a ton. As this addition to the cost of production cannot be passed on to foreign buyers, the suggestion has been made that domestic prices be advanced 2 to 3 m. (50c. to 72c.) per ton. No formal step in this direction has yet been taken, and it is expected that the syndicates will decide to await the result of the pending wage negotiations. Consumers are strongly opposed to a price increase, which would be the third this year. Since December, 1927, the domestic price of bars has been increased from 134 m. ($32.03) to 141 m. ($33.70) per ton, the export price has risen approximately from 95m. ($22.70) to 122 m. ($29.16), and the price at which the Ingot Steel Syndicate delivers to exporting manufacturers has advanced from 93 m. ($22.22) to 113.50 m. ($27.23) per ton. It is claimed, therefore, that the steel industry can easily bear the small increase in production cost caused by the rise in freight rates.

The home iron and steel market improved in the first half of September. Orders were accelerated in anticipation of a price advance. Pig iron has changed little, but an increase in activity is expected late in the year. Pig iron production in August was 1,030,837 metric tons, compared with 1,115,503 tons in August, 1927.

The export market is extremely active, but Germany cannot take full advantage of this, as the Stahlwerksverband is severely rationing sales abroad, so that the German export quota of 300,000 tons a month, as fixed by the International Steel Cartel, shall not be exceeded Firm Continental prices and active markets are expected to continue.

The domestic wire rod and wire markets are weak, but export is satisfactory, and prices are firm, except for barbed wire, in which American competition is encountered. French wire manufacturers are attempting to negotiate a national combination, which would facilitate the reestablishment of the International Wire Cartel. The International Wire Rod Cartel has raised the export price by 2s. 6d. (60c.) a ton to £6 2s. 6d. ($29.76) per ton, f.o.b. port. The German Mittelblech-Vereinigung (Medium Gage Sheet Syndicate) has been prolonged until the end of 1928, prices and selling conditions being unchanged.

The International Steel Cartel has decided to retain unchanged the production program of its members at 29,287,000 tons a year. The next meeting of the cartel will be Dec. 13. No progress was made at this month's meeting toward establishment of separate selling syndicates for different products. Poland's entry into the cartel depends upon the preliminary negotiation of a German-Polish steel agreement. Negotiations have begun, but there is not much confidence of success.

In the second quarter of 1928, as in the first, all member countries of the International Steel Cartel (Germany, France, Belgium, Luxemburg and the Saar) exceeded their production quotas. The quarterly production quota is 7,320,000 tons, but the total output of the members in the second quarter was 8,100,000 tons and in the first quarter 8,580,000 tons. Germany, whose quarterly quota is 3,160,000 tons, produced 3,710,000 tons in the second quarter and 4,210,000 tons in the first.

The Mannesmann Tube Corporation has decided to increase its capital stock by 25,000,000 m. to finance new construction in Huckingen.

The engineering industry reports less domestic business, but a slight increase in foreign orders. Reports from Belgrade state that the United Steel Works and the General Electricity Co. have made a joint offer to the Serbian Ministry of Communications to deliver all necessary railroad material during the next few years, including locomotives, cars, rails, signaling apparatus and construction machinery and equipment, on terms of 10 to 15 years' credit.

Three South-German locomotive-manufacturing corporations, the Sächsische Maschinenfabrik of Chemnitz, Maschinenfabrik Esslinger of Neckar and Maschinenbau A. G. of Karlsruhe, have entered into a collaboration agreement. This move is in opposition to the agreement made in August between the four North-German companies, Henschel, Borsig, Schwartzkopff and Maffei, and the aim is to defend state rights as guaranteed by the Railroads Law of 1920. Under this law the state railroads passed under control of the Reich, but orders for materials and equipment were to be distributed among the former railroad-owning states as before. Prussia was to receive 88.4 per cent of locomotive orders, Bavaria 4.9 per cent, Saxony 3.16 per cent, Württemberg 1.41 per cent, and Baden 2.13 per cent. The South-German companies consider that the North-German combination is a threat to their rights, and it demands that the state quotas shall be increased and not reduced.

The Automobile Manufacturers' Association reports extremely good business. This year production of private cars exceeded that of 1927 by 36 per cent and sales by 39 per cent. The association points out that Germany's automotive production this year has shown a greater percentage of increase than that of any other country in the world. Eighteen leading bicycle-manufacturing firms have agreed to form an association in the general interest of efficient production and to combat over-production. Fixing of production quotas is expected to follow. Solingen cutlery manufacturers have formed a commission to determine the best methods of carrying on a joint publicity campaign. Domestic business in cutlery is dull and export, after averaging more than 600 metric tons a month early in the year, declined in July by about 20 per cent. No improvement is expected until the Christmas demand develops.

German Steel Workers Demand Increase

(By Radio)

BERLIN, GERMANY, Oct. 1. — All syndicates' domestic prices are unchanged for October. The Steelworkers' labor union has denounced the wage agreements and demands increases. The employers have refused and declare that if the demand is persisted in a general advance in steel prices will ensue.

The European Rail Makers' Association has increased prices by 2s. 6d. (61c.) per ton. The International Tube Cartel has retained its prices unchanged.

The pig iron market is quiet and export is declining. The domestic steel market is more active, orders being placed in expectation of a rise in prices. The export market is firm with a heavy overseas demand for steel bars.

Pig iron and steel production are slowly declining. The output of pig iron in the first eight months of this year exceeds the output in the same months of 1927, but the production of steel and rolled products is slightly less than 1927.

Largest Exports Since February, 1921

One-Fourth of August Total Was Scrap—Imports Much Above July and Slightly Higher Than a Year Ago

WASHINGTON, Sept. 28.—Aggregating 287,297 gross tons, exports of iron and steel products from the United States in August were the largest since February, 1921, when they amounted to 393,328 tons, and exceeded the July, 1928, exports of 253,336 tons by 33,961 tons, or 13.4 per cent. For the eight months ended Aug. 31, exports were 1,899,375 tons, or 399,664 tons above the 1,499,711 tons exported for the corresponding period of last year, a gain of 26.6 per cent. Exports for the eight months of 1928 moved at a higher monthly average, approximately 249,000 tons, than for any period since 1920, when the average was 392,400 tons. The total for the calendar year will greatly exceed 2,000,000 tons, which, it is understood, the railroads required before making permanent the temporary reduction of 20 per cent in freight rates on export shipments of iron and steel beginning last January.

Imports in August were 69,914 tons—22,084 tons, or 46.2 per cent above the 47,830 tons in July. For the eight months ended Aug. 31 however, imports dropped 1 per cent, to 507,639 tons from 512,942 tons in the corresponding period of last year.

Scrap exports in August—70,538 tons—set a record for all time, and aided materially in swelling the total outgoing shipments of iron and steel. Of the scrap exports, 27,006 tons went to Japan, 24,536 tons to Italy, 9458 tons to Canada, 7834 tons to Poland and Danzig, and 863 tons to Mexico. Record shipments of scrap also were made during the eight months ended Aug. 31, with a total of 364,776 tons. Each of the last five months has registered above 40,000 tons, a figure never reached but once before (September, 1920).

The average daily shipment of exports in August was 9268 tons—higher than in any month for some time past, and comparing with 8172 tons in July. The daily average export movement for the eight-month period ended Aug. 31 was 7784 tons. Gains in exports in August were made in 16 classes, scrap rising 26,755 tons over July, while rails with a total of 23,999 tons made a gain of 12,920 tons. Decreases were made in shipments of plain structural material, with a loss of 7440 tons; plates, with a reduction of 2449 tons, galvanized sheets with a decrease of 1760 tons, and steel bars with a drop of 1382 tons.

For the eight months scrap represented 19 per cent of the exports; tin plate, 8.9 per cent; boiler tubes and welded pipe, 8.85 per cent; rails, 7.6 per cent; black steel sheets, 6.8 per cent; plain shapes, 6.25 per cent;

Exports of Iron and Steel from the United States

(In Gross Tons)

	August		Eight Months Ended August	
	1928	1927	1928	1927
Pig iron	8,404	4,854	42,331	31,575
Ferromanganese	1,041	138	7,039	527
Scrap	70,538	23,491	364,776	145,700
Pig iron, ferroalloys and scrap	*79,983*	*28,483*	*414,146*	*177,804*
Ingots, blooms, billets, sheet bar, skelp	16,400	9,072	89,350	59,023
Wire rods	3,620	1,612	25,737	10,903
Semi-finished steel	*20,020*	*10,684*	*115,087*	*69,926*
Steel bars	12,517	10,050	97,184	75,971
Alloy steel bars	1,231	284	9,825	3,736
Iron bars	180	243	2,469	3,356
Plates, iron and steel	12,199	12,385	98,573	93,946
Sheets, galvanized	13,581	10,936	103,998	111,986
Sheets, black steel	19,069	12,283	128,530	118,685
Sheets, black iron	1,297	1,436	10,140	11,579
Hoops, bands, strip steel	5,121	2,480	37,806	31,027
Tin plate; terne plate	22,374	16,119	169,001	188,731
Structural shapes, plain material	14,333	14,086	118,715	93,452
Structural material, fabricated	6,716	7,854	63,166	45,282
Steel rails	23,999	12,534	144,664	125,179
Rail fastenings, switches, frogs, etc	2,681	2,987	32,742	23,504
Boiler tubes, welded pipe and fittings	30,948	16,095	176,275	188,763
Plain wire	3,867	2,287	30,833	21,827
Barbed wire and woven wire fencing	5,494	5,212	49,463	33,846
Wire cloth and screening	235	200	1,297	1,570
Wire rope	509	338	3,473	3,062
Wire nails	905	728	10,937	5,493
Other nails and tacks	754	893	6,856	5,711
Horseshoes	37	62	306	347
Bolts, nuts, rivets and washers, except track	1,038	1,212	8,800	8,171
Rolled and finished steel	*179,085*	*130,704*	*1,305,053*	*1,195,224*
Cast iron pipe and fittings	2,998	1,819	22,893	17,949
Car wheels and axles	1,494	999	10,062	12,026
Iron castings	643	1,131	7,805	7,860
Steel castings	507	603	6,844	5,335
Forgings	1,318	222	7,347	3,491
Castings and forgings	*6,960*	*4,774*	*54,951*	*46,661*
All other	1,249	1,107	10,138	10,096
Total	287,297	175,752	1,899,375	1,499,711

Imports of Iron and Steel Into the United States

(In Gross Tons)

	August		Eight Months Ended August	
	1928	1927	1928	1927
Pig iron	12,990	14,084	94,340	84,780
Ferromanganese*	2,721	4,062	30,017	19,214
Ferrochrome†	94	....	491	382
Ferrosilicon‡	416	581	2,840	6,437
Scrap	5,394	4,681	31,923	41,863
Pig iron, ferroalloys and scrap	*21,615*	*23,408*	*159,611*	*152,676*
Steel ingots, blooms, billets and slabs	1,338	922	14,421	8,578
Iron blooms, slabs, etc	....	....	4	....
Wire rods	1,042	2,597	11,054	10,087
Semi-finished steel	*2,380*	*3,519*	*25,479*	*18,665*
Rails and splice bars	911	1,133	12,091	11,847
Structural shapes	19,084	16,079	118,962	104,021
Boiler and other plates	707	496	4,062	3,224
Sheets and saw plates	1,566	420	17,565	9,488
Steel bars	8,270	6,926	63,574	63,448
Bar iron	67	189	1,452	2,996
Hoops, bands and cotton ties	2,176	3,923	13,599	24,062
Tubular products (wrot.)	4,456	2,587	28,429	41,772
Nails, tacks, staples	894	539	5,757	4,545
Tin plate	32	35	783	958
Bolts, nuts, rivets and washers	6	65	160	249
Round iron and steel wire	412	196	2,842	2,919
Barbed wire	384	111	2,359	3,082
Flat wire; strip steel	224	199	1,518	1,805
Steel telegraph and telephone wire	15	....	178	31
Wire rope and strand	186	140	1,157	1,660
Other wire	53	13	373	304
Rolled and finished steel	*39,443*	*33,051*	*274,861*	*276,411*
Cast iron pipe	6,288	8,343	45,536	63,269
Castings and forgings	188	125	2,152	1,921
Total	69,914	68,446	507,639	512,942
Manganese ore*	25,996	22,964	131,490	230,797
Iron ore	225,538	303,586	1,677,206	1,879,180
Magnesite (dead burned)	6,981	....	38,391	53,524

*Manganese content only.
†Chromium content only.
‡Silicon content only.

Destination of Iron and Steel Exports from the United States

(In Gross Tons)

Country of Destination	August, 1928	January Through August 1928	January Through August 1927
North and Central America and West Indies	*116,659*	888,588	740,668
Canada and Newfoundland	95,638	731,157	564,746
Cuba	6,029	43,553	64,764
Mexico	8,773	55,547	58,689
Guatemala	198	6,297	5,104
Panama	1,323	11,023	13,400
Salvador	209	2,402	3,183
British West Indies	715	5,597	9,626
Other West Indies	2,529	21,962	12,643
Other Central America	1,245	11,050	8,513
South America	*44,492*	*302,383*	*246,530*
Argentina	9,247	66,990	55,042
Brazil	8,528	59,463	51,532
Chile	9,408	49,700	28,869
Colombia	3,143	45,740	40,729
Peru	1,223	15,511	25,358
Uruguay	947	6,385	7,700
Venezuela	11,693	54,902	35,517
Other South America	303	3,692	1,783
Europe	*43,230*	*225,265*	*136,897*
Belgium	1,779	10,766	3,239
France	257	3,203	3,893
Greece	9	1,893	2,507
Italy	27,208	79,583	37,867
Netherlands	103	1,535	2,119
Russia	608	2,584	5,643
United Kingdom	3,944	35,408	49,536
Other Europe	9,322	90,293	32,093
Far East	*82,289*	*473,467*	*362,674*
British Malaya	937	4,793	6,552
China	5,457	69,715	38,308
Dutch East Indies	7,628	25,369	26,178
India and Ceylon	3,794	18,120	21,143
Japan and Chosen	51,482	261,643	189,001
Kwangtung	4,569	9,048	15,863
Philippine Islands	5,936	61,064	37,416
Australia	1,747	10,942	19,128
New Zealand	218	1,429	810
Other Asia and Far East	521	11,344	8,270
Africa	*627*	*9,672*	*12,942*
British South Africa	187	4,001	5,900
Egypt	8	3,414	2,924
Mozambique	123	913	3,304
Other Africa	309	1,344	814
Total	287,297	1,899,375	1,499,711

galvanized sheets, 5.5 per cent; plates, 5.2 per cent; steel bars, 5.1 per cent, and ingots and semi-finished material, 4.7 per cent.

Of the rails exported in August, 4466 tons went to Canada, 2071 tons to Brazil, 1208 tons to Mexico and 929 tons to Japan. Tin plate exports in August, amounting to 22,374 tons, were widely distributed, Canada taking 4775 tons; Japan, 4025 tons; Argentina, 3099 tons; Brazil, 1355 tons, and Mexico, 1113 tons. Of the 19,069 tons of black steel sheets exported during the month 9291 tons went to Canada and 7719 tons to Japan. Canada took 2613 tons of the 12,199 tons of plates exported in August and 2613 tons of the 13,581 tons of galvanized sheets exported that month, while the Philippine Islands took 2232 tons of the latter. Of the 12,517 tons of steel bars exported in August, Canada took 8145 tons and the United Kingdom 1766 tons. Venezuela was the destination of 7730 tons of the 15,164 tons of casing and oil line pipe exported during the month, while 2954 tons went to Java and Madura and 1223 tons to Mexico. Of the 10,214 tons of black welded pipe exported during the month, 1933 tons went to Canada, 1443 tons to Japan, 1300 tons to Argentina and 1241 tons to Venezuela.

Increases in the eight months' exports ended Aug. 31, over the corresponding period of last year, were made in 27 classes and were most marked in scrap, ingots and semi-finished steel, plain structural shapes, steel bars and rails. The principal losses were in tin plate, boiler tubes and welded pipe and galvanized sheets.

Of the August exports, Canada, continuing in first position, took 95,314 tons; for the first eight months the total going to that country was 563,980 tons. Japan and Chosen took 51,482 tons in August and 189,001 tons during the eight months.

August imports showed gains in 20 groups, chiefly in structural shapes, whose total of 19,084 tons reflected an increase of 7892 tons over the July imports of this product. Pig iron, with a total of 12,990 tons, showed an increase of 6935 tons over July, and steel bars, with a total of 8270 tons, a gain of 3278 tons. Imports declined in six groups, but only two, cast iron pipe and rails, were of importance, the former showing a drop of 1443 tons and the latter a decrease of 523 tons. Of the pig iron imports, 7485 tons came from India and 2550 tons from the United Kingdom. Of the imports of steel bars, 2641 tons came from France, 2637 tons from Belgium, 1754 tons from Germany and 1104 tons from Sweden. Of the plain shapes imported in August, 10,816 tons came from Belgium, 5100 tons from France and 2709 tons from Germany.

Of the 6288 tons of cast iron pipe imported that month, 4763 tons came from France and 1523 tons from Belgium. "Other pipe" imports, chiefly seamless tubes, totaled 4456 tons, of which 1938 tons came from Germany, 1216 tons from the United Kingdom, 538 tons from Poland and Danzig, 398 tons from Canada and 136 tons from France. Of the 911 tons of rails imported in August, 823 tons came from Canada.

Belgium led as the greatest single source of imports in August, providing 17,367 tons. France was second with 14,138 tons, and Germany was third with 10,267 tons. Canada furnished 7819 tons, and India, 7495 tons.

United States Imports of Iron and Steel Products in August

From	Gross Tons
Austria	94
Belgium	17,367
Czechoslovakia	25
France	14,138
Germany	10,267
Italy	44
Netherlands	2,291
Norway	1,514
Poland and Danzig	538
Sweden	2,914
Switzerland	17
United Kingdom	5,357
Europe	*54,566*
Canada	7,819
Mexico	32
British India	7,495
Japan	1
China	1
Total	69,91

Higher Production of Malleable Castings

Production of malleable castings in August is reported by the Department of Commerce at 61,833 tons, compared with 54,373 tons in July and with 51,394 tons in August of last year. Except for last March, the August tonnage was the highest since March, 1927. Shipments in August were 58,914 tons, a gain of 10 per cent over the July shipments of 52,694 tons. These figures compare with 50,258 tons in August, 1927.

Orders booked, at 56,415 tons, were somewhat less than the month's production, but represented the largest amount since last March and, with that exception, the largest since February, 1927. Capacity was engaged in August to the extent of 68.5 per cent.

For the first eight months, production was 472,508 tons against 450,692 tons last year. Shipments were 450,676 tons against 440,620 tons in 1927. Orders booked were 436,761 tons against 402,913 tons last year. All figures are from 130 "identical" plants.

A new oxygen plant of the Linde Air Products Co. has started operations at Akron, Ohio. It will supply the nearby demand for oxygen used in welding and cutting by the oxy-acetylene process.

The fall meeting of the American Refractories Institute, originally scheduled for Pittsburgh, has been transferred to the Vanderbilt Hotel, New York. The date of the meeting is Oct. 24.

Machinery Exports Continue Heavy

August Shipments Only 7.3 Per Cent Below July—Agricultural Implements 31 Per Cent of Total

WASHINGTON, Sept. 28.—Exports of machinery of all kinds in August aggregated $44,303,235 in value, against $47,814,163 in July, the latter having set the highest record in seven and one-half years. The August shipments were almost $3,000,000 in excess of those of August of last year, when the total value was $41,042,546. For the eight months ended Aug. 31, 1928, the total of $331,863,954 was $38,900,988 in excess of similar shipments for the corresponding period of last year, with a total of $292,962,966.

Exports of industrial machinery in August were valued at $19,173,465, compared with $21,094,582 in July and with $17,493,611 in August, 1927. For the eight months ended Aug. 31, exports of industrial machinery were valued at $149,488,032, against $136,117,937 for the corresponding period of last year. Exports of power-driven metal-working machinery in August were valued at $2,650,532, compared with $2,562,201 in July and with $1,683,994 in August of last year. For the eight months ended Aug. 31, exports of this class of machinery were valued at $17,357,134, against $12,193,040 for the corresponding period of 1927.

Exports of power-driven metal-working machinery listed in THE IRON AGE table numbered 833 in August, valued at $1,712,938, against 1111, valued at $1,734,060, in July.

Following the trend that was so pronounced in July, exports of machinery in August were raised to their high level largely by reason of the heavy shipments of agricultural implements, which were valued at $13,697,000, a drop of only 2.1 per cent from the record-breaking $13,996,000 of July.

Imports of machinery and vehicles in August were valued at $2,729,543, compared with $2,306,665 in July and with $1,895,311 in August of last year. For the eight months ended with August, the value was $18,970,787, against $18,904,646 for the corresponding period of last year. Imports of industrial, office and printing machinery in August amounted to $1,829,834, against $1,516,328 in July and $1,215,700 in August of last year. For the eight months ended with August, the total was $11,776,942, compared with $11,326,725 for the corresponding period of last year.

Imports of machinery listed in THE IRON AGE table were valued in August at $2,081,751, against $1,606,365 in July and $1,270,993 in August of last year. For the eight months ended with August, the value was $13,916,841, against $13,061,582 for the corresponding period of last year, showing a gain of 6½ per cent.

Drop in Steel Boiler Orders

Orders for steel boilers in August covered 1649 units, with 1,459,652 sq. ft. of heating surface. This was the smallest amount since May, although the differences have been slight. It compares with 1,528,053 sq. ft. in July and with 1,568,536 sq. ft. in August of last year. In the first eight months of 1928 the total was 10,582,669 sq. ft., a drop of about 10 per cent from the 11,619,091 sq. ft. of the corresponding period in 1927.

Machinery Exports from the United States

(In Thousands of Dollars)

	August		Eight Months Ended August	
	1928	1927	1928	1927
Locomotives	$343	$147	$1,994	$4,304
Other steam engines	420	149	682	1,016
Boilers	105	248	801	1,345
Accessories and parts	61	35	424	325
Automobile engines	1,246	847	10,593	8,814
Other internal combustion engines	875	618	5,864	4,931
Accessories and parts	272	185	2,525	2,454
Electric locomotives	43	11	1,112	313
Other electric machinery and apparatus	708	512	5,317	5,236
Excavating machinery	601	461	5,081	3,148
Concrete mixers	113	92	727	811
Road-making machinery	212	131	1,570	1,535
Elevators and elevator mach'ry	318	383	2,942	3,337
Mining and quarrying mach'ry	1,070	1,106	9,103	9,175
Oil-well machinery	1,613	1,599	10,019	13,522
Pumps	572	505	3,885	4,455
Bending and power presses	245	169	1,369	868
Machine tools*	1,489	912	10,578	7,395
Forging machinery	72	130	537	676
Other metal-working machinery and parts	572	540	4,111	3,216
Textile machinery	1,052	1,022	8,976	7,279
Sewing machines	694	798	5,892	6,254
Shoe machinery	191	167	1,244	1,129
Flour-mill and gristmill machinery	26	55	303	373
Sugar-mill machinery	288	448	2,784	2,252
Paper and pulp-mill machinery	155	262	2,086	2,684
Sawmill machinery	74	61	624	542
Other woodworking machinery	230	109	1,274	954
Refrigerating and ice-making machinery	613	590	6,413	4,977
Air compressors	473	558	4,607	4,122
Typewriters	1,106	1,522	14,296	13,947
Power laundry machinery	76	163	755	1,141
Typesetting machines	321	430	3,024	2,895
Printing presses	564	821	4,079	4,272
Agricultural machinery and implements	13,697	11,851	81,686	63,766
All other machinery and parts	13,793	13,406	114,587	99,500
Total	$44,303	$41,043	$331,864	$292,963

*Principal details in another table.

Imports of Machinery Into the United States

(By Value)

	August		Eight Months Ended August	
	1928	1927	1928	1927
Metal-working machine tools	$30,584	$23,738	$397,731	$281,279
Agricultural machinery and implements	277,835	268,958	3,506,061	4,071,941
Electrical machinery and apparatus	190,322	186,346	989,405	1,219,646
Other power-generating machinery	366,389	90,822	489,697	137,108
Other industrial machinery	914,834	566,300	6,490,752	5,834,754
Vehicles, except agricultural	301,787	134,829	2,043,195	1,516,854
Total	$2,081,751	$1,270,993	$13,916,841	$13,061,582

Exports of Power-Driven Metal-Working Machinery

	August, 1928		July, 1928	
	No.	Value	No.	Value
Engine lathes	86	$243,694	52	$93,350
Turret lathes	37	129,768	36	103,363
Other lathes	91	193,436	115	341,636
Vertical boring mills and chucking machines	17	36,068	11	14,297
Thread-cutting and automatic screw machines	58	98,399	65	87,811
Knee and column type milling machines	50	91,789	28	74,931
Other milling machines	60	101,102	62	280,113
Gear-cutting machines	48	141,695	35	105,066
Vertical drilling machines	44	86,024	109	136,196
Radial drilling machines	14	48,622	6	12,903
Other drilling machines	81	61,128	375	108,626
Planers and shapers	52	105,532	24	40,461
External cylindrical grinding machines	82	201,025	99	216,122
Internal grinding machines	54	146,143	39	85,537
Metal-working tool-sharpening machines	59	28,513	55	33,648
Total	833	$1,712,938	1,111	$1,734,960

Machinery Markets and News of the Works

Machine Tool Trade Active

September Orders Closely Approximated Those of August—Automobile Companies Buying

MACHINE tool orders turned upward in the last week of September, and the total for the month closely approximated that of August, which was an unusually good month. Automobile manufacturers and companies making automobile parts and accessories contributed a considerable share of recent business, though the diversification of buying was an outstanding feature.

Moreover, the volume of pending business indicates that there will be no marked letdown in purchases this month. Production in machine tool plants in the Cincinnati district is being maintained at the highest rate since 1919-1920. Unfilled orders at many plants have increased to an extent which, with normal business during the next month or two, assure steady operations during the remainder of the year. Orders taken by Chicago dealers in the first nine months of the year were the largest for any like period since 1920.

Although railroad buying is conspicuously light, the orders from general industrial lines are extremely satisfactory in volume. The changes in models by some of the automobile companies have resulted in needs for new equipment.

Chicago trade prospects are enlivened by the report that the International Harvester Co. will probably spend about $500,000 for equipping its Rock Island, Ill., plant, and the Allis-Chalmers Co., West Allis, Wis., is making a survey of equipment needed for the production of a light farm tractor. The Seaman Body Corporation, Milwaukee, and the Nash Motors Co., Racine, Wis., will shortly make extensive purchases for new plant additions.

New York

NEW YORK, Oct. 2.—The volume of inquiry for machine tools is steady and comes from widely distributed sources. Although there are few buyers of large lots, numerous orders for single tools are being received. R. Hoe & Co., New York, recent purchasers of a large Ingersoll milling machine, are considering the purchase of another, which will probably reduce the number of planers to be bought. Other new equipment may also be required by this company. The General Electric Co. continues as a buyer of machine tools for Schenectady, having ordered a shaper, a bending machine and a lathe last week. New inquiries call for eight 16 and 18-in. engine lathes and a No. 2 Baker key-seating machine. Manufacturers of airplanes are not active buyers of tools, except the Curtiss Aeroplane & Motor Co., Buffalo, which is buying a few single tools for its Buffalo plant.

Niles-Bement-Pond Co. reports following sales: Three No. 3 axle lathes, a combination journal turning and axle lathe, two 30-in. x 22-ft. Time-Saver lathes, three Morris radial drills, a Cincinnati 6-in. high-speed automatic tapper, a Cincinnati high-speed 4-spindle drill, a Ransom grinder and a Boye & Emmes 18-in. x 12-ft. lathe. Pratt & Whitney division sold six lathes, a No. 10 hand milling machine, one 8-in. rotary surface grinder and two 14-in. vertical surface grinders, an automatic worm grinder, a 3A universal die sinker, a No. 2 jig boring machine and a 12-in. vertical shaper.

Plans have been approved by Ford Motor Co., Detroit, for expansion and improvements at Green Island, N. Y., plant, with installation of equipment for manufacture of shock absorbers of about 6000 units per day. Parts, assembling and service work as heretofore handled at this plant will be discontinued.

Board of Trustees, American Museum of Natural History, Columbus Avenue and Seventy-seventh Street, New York, has plans for a five-story power plant and service building to cost more than $750,000 with equipment. Trowbridge & Livingston, 527 Fifth Avenue, are architects and engineers.

Packard Motor Car Co. of New York, Broadway and Sixty-first Street, has awarded general contract to Turner Construction Co., Graybar Building, for new eight-story service, repair and sales building on Eleventh Avenue, extending from Fifty-fourth to Fifty-fifth Street, to cost about $1,500,000 with equipment. Plant at Long Island City will be removed to new location and additional machinery provided. Albert Kahn, Marquette Building, Detroit, is architect; Frank S. Parker, 119 West Fifty-seventh Street, New York, is associate architect.

Steel & Tubes, Inc., Scott Avenue, Brooklyn, has plans under way for one-story addition, to cost over $50,000 with equipment. Austin Co., 120 Broadway, New York, is architect and engineer.

Union Free School District No. 9, Pleasantville, N. Y., is said to be planning installation of manual training equipment in a proposed high school to cost about $400,000. Tooker & Marsh, 101 Park Avenue, New York, are architects.

New York Railways Corporation, 123 West 146th Street, New York, has filed plans for a two-story motor bus garage, service and repair building at Lexington Avenue and 100th Street, to cost about $100,000 including equipment.

F. J. Ross, 4200 White Plains Avenue, New York, architect, has plans for a multi-story automobile service, repair and garage building, 100 x 100 ft., to cost over $150,000 with equipment.

Funk Printing Press Co., 150 Nassau Street, New York, manufacturer of printing presses, parts, etc., has acquired property between Princeton Junction and Plainsboro, N. J., for new plant, with one-story initial unit, 40 x 400 ft., to cost over $100,000 with equipment. Company will establish new industrial community, with housing development for employees.

Brinkerhoff Electric Co., 171 Franklin Street, New York, manufacturer of electric lamps, etc., has plans for new two-story and basement plant, with foundations for third story, at West New York, N. J., 70 x 180 ft., to cost more than $75,000 with equipment. Lockwood, Greene & Co., 1 Pershing Square, New York, are architects and engineers.

Newark Transformer Co., 17 Frelinghuysen Avenue, Newark, manufacturer of electric power equipment, has engaged Joseph Kennedy, 44 Grove Street, Arlington, N. J., architect, to prepare plans for two-story plant, 25 x 100 ft., on Sherman Avenue, to cost about $40,000 with machinery.

Lackawanna Railroad Co., 90 West Street, New York, is planning for electrification of portion of suburban system from Hoboken to Dover, N. J., and vicinity, 173 miles, to overhead contact system, to cost $14,000,000 with equipment, exclusive of power plant. Construction of steam-operated electric generating plant on Hackensack River, where property has been secured, is under consideration, to cost about $4,000,000. Project is scheduled for completion within 15 to 18 months.

Gates-Day Aircraft Corporation, 909 East Twenty-third Street, Paterson, N. J., manufacturer of commercial and military planes, etc., is disposing of a common

The Crane Market

NEW inquiry for both electric overhead and locomotive cranes continues rather small. Some fair business is evidently in prospect from subway contracts about to be awarded in New York and for which contractors have been asking prices on crawl-tread locomotive cranes, truck cranes and steam shovels. One such contract requires a crane and a steam shovel with boom to operate in a tunnel with 17-ft. of headroom. One of the larger locomotive crane inquiries pending at present is a list of six small crawl-tread cranes for the Pennsylvania Railroad. But little new inquiry has developed for overhead crane equipment, but there is a good volume of old inquiries in the market, several of which are expected to close soon. The Missouri Public Service Commission has authorized the Missouri Pacific Railway and the Universal Carloading Co. to install a gantry crane at the railroad's freight house at Second and Biddle Streets, St. Louis.

Among recent purchases are:

Western Electric Co., Kearny, N. J., 5-ton, 95-ft. span, electric crane from Cleveland Crane & Engineering Co.

Pittsburgh Pipe & Coupling Co., 5-ton, 45-ft. span crane from Box Crane & Hoist Corporation.

Deere & Co., Moline, Ill., ¾-yd., 80-ft. span crane and 5-ton, 3-motor, 86-ft. span overhead electric crane from Milwaukee Electric Crane & Mfg. Corporation.

McClintic-Marshall Co., Marova Plant, Chicago, 15-ton, 5-ton auxiliary, 80-ft. span overhead electric crane from Milwaukee Electric Crane & Mfg. Corporation.

stock issue to total $3,000,000, part of fund to be used for expansion in output. Company also operates a subsidiary, Gates Flying Circus & Aviation Co., Teterboro, near Paterson. Ivan R. Gates is president.

Royal-Dutch-Shell Co., London, England, operating Asiatic Petroleum Co., 65 Broadway, New York, and other properties in United States, has purchased substantial interest in Flintkote Co., Rutherford, N. J., manufacturer of roofing products, and will take active part in management. A fund of about $9,000,000 will be secured by Flintkote organization, a portion to be used for expansion in plants and facilities. Factories are being operated at Rutherford, Cincinnati, Chicago Heights, and New Orleans. Headquarters are at 31 St. James Avenue, Boston.

American Telephone & Telegraph Co., 195 Broadway, New York, has plans under way for new testing and repeater station, four stories, 45 x 76 ft., at Morristown, N. J., to cost about $100,000 with equipment. Voorhees, Gmelin & Walker, 101 Park Avenue, New York, are architects.

International Oxygen Co., Newark, has taken over business of Tariffville Oxygen & Chemical Co., Tariffville, Conn., and has organized Tariffville Oxygen Co. as New England division of International company. New company will continue manufacture of oxygen, hydrogen and acetylene and will also handle products of International company.

Chicago Watchman's Clock Co., Inc., has removed its New York office to 70 East Forty-fifth Street, in charge of H. R. Kirkland and John G. Earl. August H. Nanz is no longer connected with company.

New York Central Railroad Co., Grand Central Terminal, New York, has awarded general contract to Walsh Construction Co., Herald Building, Syracuse, N. Y., for one and two-story repair shop at Garrison, N. Y., including signal station, to cost $40,000 with equipment.

Buffalo

BUFFALO, Oct. 1.—Property at Tonawanda, N. Y., has been acquired by Curtiss Aeroplane & Motor Co., Kail Street, Buffalo, as site for new works, and plans for initial unit will be drawn soon. It will be equipped for production of aircraft motors for commercial purposes, including parts manufacture and assembling, and will cost more than $750,000.

Ritter Dental Mfg. Co., 404 West Avenue, Rochester, N. Y., is said to be arranging early call for bids on general contract for one-story addition to manufacture dental chairs, instruments, etc., to cost about $200,000 with equipment. C. A. Carpenter, Temple Building, is architect.

Francis E. Cunningham, 10 South Goodman Street, Rochester, and associates have organized Cunningham-Hall Aircraft Corporation, with capital of $350,000, and plan early operation of plant to manufacture commercial airplanes and parts. James C. Dryer, East Avenue, Brighton, N. Y., is also interested in company.

Binghamton Light, Heat & Power Co., Binghamton, N. Y., is arranging an expansion and improvement program, including construction of high-tension transmission line from city to Scranton, Pa., about 80 miles, with power substations, switching stations, etc., to cost more than $250,000. Company is under direction of General Gas & Electric Corporation, 50 Pine Street, New York.

Metallurgical Equipment & Supply Co., Binghamton, N. Y., care of Samuel Tour, 123 North Street, Batavia, N. Y., recently organized by Mr. Tour and associates with capital of $50,000, plans operation of local plant to manufacture furnaces and machinery for metallurgical production. Walter N. Grounsell, 60 Johnson Avenue, Binghamton, is also interested in company.

South Atlantic

BALTIMORE, Oct. 1.—Locke Insulator Corporation, Charles and Cromwell Streets, Baltimore, manufacturer of high-tension electric insulators, is planning a one-story addition to cost about $45,000 with equipment.

Baltimore & Ohio Railroad Co., Baltimore, has approved plans for a group of electrically-operated pumping stations and water treating plants on Cumberland division, to cost about $1,000,000 with machinery, including sites at Evitts Creek, Md.; Green Spring, Sir John's Run, Miller, Martinsburg and Brunswick.

J. E. Sperry, Calvert Building, Baltimore, architect, has plans for multi-story automobile service, repair and garage building, to cost over $450,000 with equipment.

Richmond Car Works, Inc., Richmond, Va., subsidiary of Standard Steel Car Co., Frick Building, Pittsburgh, is arranging an expansion and improvement program, including additional building units and new equipment to cost close to $500,000.

Board of Education, Raleigh, N. C., is considering installation of manual training equipment in new three-story and basement high school, to cost $280,000, for which superstructure will soon begin. William H. Dietrick, Professional Building, is architect.

Public Improvement Commission, City Hall, Baltimore, has authorized appropriation of $608,000 for extensions and improvements in Vernon pumping plant, with installation of electrically-operated pumping machinery and auxiliary equipment, to replace present Mount Royal steam-operated pumping station, which will be abandoned. Charles F. Goob is chief engineer.

Dixie Aircraft Corporation, Lynchburg, Va., R. S. Skinner, president, has purchased 65-acre tract near Hampton, Va., as site for new airport, including hangar, service and repair building and other units. An airplane assembling plant is under consideration. Project will cost approximately $65,000.

General Purchasing Officer, Panama Canal, Washington, is asking bids until Oct. 17 for air compressor, boiler, pump, gasoline engine, bolts, nuts, reamers, wire rope, insulated wire, and other equipment. Panama Schedule 1904.

American Enka Corporation, 114 East Thirty-second Street, New York, plans construction of a power station, pumping plant, machine shop and other units at proposed rayon mill on 2100-acre tract near Asheville, N. C., entire project to cost more than $6,000,000.

Steuart Brothers, Inc., 151 Twelfth Street, N. E., Washington, is planning construction of four-story automobile service, repair and garage building on Fifth Street, N. E., to cost about $130,000 with equipment.

Taylor Iron Works & Supply Co., Broadway, Macon, Ga., is planning construction of one-story foundry, boiler shop and pattern works, to double present capacity, to cost over $60,000 with machinery.

New England

BOSTON, Oct. 1.—Used tool dealers appear to have been more active than new the past week, a condition that has not developed for a long time. In general dealers in this line of equipment have done more business than in several weeks. Presses, small and medium, screw machines, and lathes from 12 to 24-in. have been the best sellers. A Connecticut used tool dealer has sold automatic machinery, very largely turret lathes and

gear and screw making equipment, in the Massachusetts and Rhode Island territories with satisfying results. The same dealer reports larger sales in Connecticut during September than in any month since early spring.

Local dealers in new tools have been handicapped by the sale of the excess tools of the abandoned Lowell plant of the Saco-Lowell Shops. The best of this equipment has been sold. Inquiries for new tools are more numerous, especially for high priced production units.

Small tools are moving well and September sales by some houses have established a new high record for this year.

Davidson Fan Co., 15 Brooks Street, Newton, Mass., has awarded contract for a new two-story, 50 x 100 ft., plant.

City of Springfield, Mass., has started work on a two-story, 137 x 180 ft., junior high school addition to contain vocational shops. E. C. and G. C. Gardner, 35 Lyman Street, Springfield, are architects.

Builders Iron Foundry Co., Codding Street, Providence, has started work on a one-story plant, 44 x 103 ft. It is understood that all of the necessary equipment has not been purchased.

City Council, Cranston, R. I., is considering installation of seven pumping plants in connection with extensions and improvements in municipal sewage system, with waste disposal and treating plants, to cost $2,826,500. A fund of $2,500,000 has been authorized by State legislature for work. Fay, Spofford & Thorndike, 44 School Street, Boston, are consulting engineers.

Board of Education, Hartford, Conn., has authorized installation of manual training department in addition to be built at Alfred Plant junior high school, West Hartford, for which bids will soon be asked on general contract. Russell F. Baker, Hartford, is architect.

National Packaging Machine Co., 445 Watertown Street, Newtonville, Mass., has awarded general contract to F. L. Fox, 101 Milk Street, Boston, for a four-story addition, to cost over $60,000 with equipment.

Packard Motor Car Co., 1089 Commonwealth Avenue, Boston, is revising plans for new four-story service, repair and sales building, 115 x 230 ft., to cost over $200,000 with equipment. Albert Kahn, Marquette Building, Detroit, is architect and engineer.

New Departure Mfg. Co., Bristol, Conn., nas let contract to Aberthaw Co., Boston, for one-story addition to forge shop, 130 x 200 ft.

Milwaukee

MILWAUKEE, Oct. 1.—Estimates of September machine-tool business indicate about the same average as August, and for many plants October opens with a large volume of orders. The outlook is considered very favorable, and production schedules will probably have to be kept at the present level until after Jan. 1 to make specified deliveries. Local buying of equipment continues excellent.

Allis-Chalmers Mfg. Co., Milwaukee, is about to purchase equipment for its tractor department at main works in West Allis for production of a small tractor to supplement line of farm tractors.

Northwestern Steel & Iron Works, Eau Claire, Wis., has placed contracts for a one-story addition, 48 x 100 ft.

Advance Car Mover Co., 930 East John Street, Appleton, Wis., is building a new factory to manufacture a device to move freight cars in yards by manual means. General contract has been let to Austin Co., Cleveland.

Chicago & North Western Railway Co., 226 West Jackson Boulevard, Chicago, contemplates erection of a new roundhouse, machine shop and storage building at Iron River, Mich.

John Strange Paper Co., Washington Street, Menasha, Wis., has plans by Orbison & Orbison, consulting engineers, Appleton, Wis., for a new boiler house to cost about $75,000.

Bids close Oct. 16 in office of John Jedwabny, Jr., city clerk, Menasha, Wis., for construction and equipment of an addition to municipal water and light plant to cost $75,000. An additional Diesel engine with generator, motors, switchboard and appurtenances is specified.

Maynard Electric Steel Casting Co., 1328 Twenty-second Avenue, Milwaukee, has placed contracts for construction of a one-story foundry addition, 100 x 121 ft.

C. C. Nielson and Axel O. Nielson have acquired interest of John C. Burkell in Nielson Machine Co., Racine, Wis., and will continue business under original title.

Philadelphia

PHILADELPHIA, Oct. 1.—Plant of McFarland-Meade Co., Seventy-first Street and Kingsessing Avenue, Philadelphia, on 2-acre tract heretofore used for manufacture of metal sash, doors, etc., has been acquired by Wilkening Mfg. Co., Fifteenth and Mount Vernon Streets, operating Duoflex Piston Ring Co., and will be occupied by last noted organization. Present plant will be removed to new location and additional equipment installed. F. W. Wilkening is president.

United States Gypsum Co., Chicago, has authorized construction of new plant for manufacture of gypsum products on 7-acre tract at Fifty-eighth Street and Schuylkill River, Philadelphia. Initial units will cost over $500,000 with machinery. Company is said to contemplate paper mill at same location.

Heintz Mfg. Co., Front and Olney Streets, Philadelphia, manufacturer of steel automobile bodies, has asked bids on general contract for a one-story addition, to cost about $27,000.

General Motors Truck Co., Twenty-third and Carpenter Streets, Philadelphia, with headquarters at Pontiac, Mich., has arranged for erection of new service, repair and sales building at Wilmington, Del., to be built by E. M. Harris, 2214 Chestnut Street, Philadelphia, to cost $250,000 with equipment.

Hercules Powder Co., Wilmington, Del., is carrying out an expansion program at Parlin, N. J., including construction of several new buildings, with compressor plant, 60 x 90 ft. Air compressors, pumps, tanks and other equipment will be installed. Project will cost more than $150,000.

Hobson Flatware Co., Lansdale, Pa., manufacturer of chromium and nickel plated ware, has taken option on two-acre tract at Lambertville, N. J., as site for new plant, and plans to break ground for first unit this month. It is reported to cost about $75,000 with equipment. Works at Lansdale will be removed to new location.

Pennsylvania Gypsum Co., Chester, Pa., has approved an expansion and improvement plan at local mill, with installation of additional machinery for manufacture of gypsum building products. A new pier will be built and equipped with unloading, conveying and other apparatus for handling gypsum rock. Company is said to be projecting plans for new plant at Brooklyn.

Board of Education, Kingston, Pa., is said to be planning installation of manual training equipment in new two-story high school to cost $750,000, for which superstructure will soon begin. Mack & Sahm, Coal Exchange Building, Wilkes-Barre, Pa., are architects.

Beaver Saw Filing Machine Co., York, Pa., care of Robert F. Fluhrer, York, attorney, now being organized by local interests, is planning early operation of plant for manufacture of tools for sharpening hand and circular saws and kindred equipment.

Reading Iron Co., Reading, Pa., will establish a new cut nail and galvanizing plant at Pottstown, Pa. Present unit at Birdsboro, Pa., will be discontinued and equipment removed to Pottstown mill where facilities will be provided for larger output.

Keystone Aircraft Corporation, Bristol, Pa., is planning an expansion and improvement program, including installation of additional equipment. Arrangements are being made for sale of stock to an amount of $1,050,000, a portion of fund to be used for extensions.

Lehigh Valley Coal Co., Wilkes-Barre, Pa., is reported planning construction of new electrically-operated coal breaker between Maysville and Kulpmont, to cost more than $500,000 with machinery.

American Telephone & Telegraph Co., 15 Dey Street, New York, has awarded contract to Morton C. Tuttle Co., Boston, for design and construction of trans-ocean telephone transmitting station at Lawrenceville, N. J. Development will include two buildings, 76 x 96 ft. and 60 x 76 ft., two stories and basement. Antenna system 4500 ft. long on steel towers will transmit to Europe, and development will later include circuits to South America.

Chicago

CHICAGO, Oct. 1.—September sales of machine tools have been numerous and the month closes only a trifle less active than August. Orders taken by Chicago dealers in the first nine months of 1928 establish a record for similar periods since 1920 and fresh inquiry gives promise that October business will be large. Outstanding among prospects is a probable purchase of $500,000 worth of machine tools by the International Harvester Co. for its Rock Island, Ill., plant.

Allis-Chalmers Mfg. Co. is expected to purchase some equipment to manufacture a light tractor at its West Allis plant. Seaman Body Corporation, Milwaukee, and Nash Motors Co., Racine, Wis., will make early purchases for plant additions. Miscellaneous business is active. Chicago, Rock Island & Pacific has ordered two planer-shapers.

Work has been started on foundation of a 60 x 120-ft. addition for Lappen Foundry, Crookston, Minn.

Plans are being completed by All-Steel Equipment Co., Griffith Avenue, Aurora, Ill., manufacturer of factory and office equipment and fixtures, for a one and two-story addition to cost $25,000. Her-

bert E. Spieler, Graham Building, is architect.

General Engineering Works, 340 West Huron Street, Chicago, manufacturer of screw machine products, has purchased property on West Division Street for new one-story plant, to cost more than $85,000 with equipment.

General Laundry Machine Co., 1223 South Talman Avenue, Chicago, has authorized plans for a new one-story plant, to cost close to $100,000 with equipment. F. E. Davidson, 53 West Jackson Boulevard, is architect.

Public Service Co. of Colorado, Fifteenth Street, Denver, has awarded a general contract to F. H. Cowell, Central Savings Bank Building, for a new equipment storage and distributing plant, with repair department, to cost about $110,000 with machinery.

Elco Tool & Screw Co., Rockford, Ill., has awarded general contract to Bakken & Anderson, 1102 Broadway, for rebuilding portion of two-story plant recently destroyed by tornado, to cost over $150,000 with equipment. Peterson & Johnson, Swedish-American Bank Building, are architects.

City Council, Baudette, Minn., is considering installation of municipal electric light and power plant, using Diesel engine units, to cost about $30,000.

Washburn-Crosby Co., Chamber of Commerce Building, Minneapolis, Minn., is said to be planning to rebuild part of flour mill A, recently destroyed by fire, with loss of about $200,000 including equipment.

Knapp Brothers Mfg. Co., Cicero, Ill., manufacturer of metal building products, metal trim, etc., has plans for new one-story plant at Joliet, Ill., 120 x 600 ft., to cost over $100,000 with equipment.

Michael George Pen Co., Grand Haven, Mich., manufacturer of fountain pens, has approved plans for a new one-story plant, 60 x 145 ft., at Libertyville, Ill., to cost about $65,000 with equipment.

Martin Machine Works formerly at 228 South Laflin Street, Chicago, is now located in new quarters at 2234-36 Walnut Street.

Cincinnati

CINCINNATI, Oct. 1.—Machine tool buying took an upward turn the past week with the result that sales in September closely approximated those in August. Automobile manufacturers and companies making automobile parts have continued to supply the bulk of current business, although the diversified sources of recent bookings testify to the healthy condition of industry in general. Builders specializing in equipment for automobile makers report signs of an expansion in demand for their product in the Detroit district.

The volume of pending orders is unusually heavy and indicates no let-down in purchases of machine tools for at least the next month. Production in local plants is being maintained at a high rate with the largest number of workers since 1919-1920. Unfilled orders have accumulated to such an extent that a slowing up in operating schedules may not come before the end of the year. A local company has received an order for four special lathes, valued at approximately $35,000, from Europe. A Detroit company has contracted for five large lathes.

Contract has been let by Container Corporation of America, Inc., 5500 Eastern Avenue, Cincinnati, manufacturer of corrugated board products, to Rust Engineering Co., Pittsburgh, for two-story addition, 180 x 300 ft., to cost more than $200,000 with machinery. Devore Co., Toledo, Ohio, is architect and engineer.

Cincinnati Oakland Motor Car Co., 1926 Gilbert Avenue, Cincinnati, local representative for Oakland automobile, is having plans drawn for one and two-story service, repair, assembly and garage building, to cost over $100,000 with equipment. H. Neilson Jackson, Mercantile Library Building, is architect.

Wessling Brothers Foundry Co., Liberty and McLean Streets, Cincinnati, has acquired tract on Johnson Street, and plans new one-story foundry to cost close to $110,000 with equipment. Present business will remove to new location.

Louisville Gas & Electric Co., Louisville, has increased stock from $45,000,000 to $90,000,000, a portion of proceeds to be used for expansion and improvements. Company has been carrying out new hydroelectric power development at Ohio Falls.

Mead Pulp & Paper Co., Chillicothe, Ohio, is planning an expansion and betterment program at local mill, to include installation of paper-making equipment, coating machine and auxiliary equipment, to cost more than $175,000. An addition will be built also to branch mill at Kingsport, Tenn.

Meehanite Metal Wheel Co., Chattanooga, Tenn., recently organized by Gus Meehan, head of Meehan Foundry Co., Chattanooga, and associates, with capital of $25,000, is planning operation of local plant. New company is represented by C. A. Noone, First National Bank Building.

Armstrong Furnace Co., London, Ohio, M. B. Armstrong, president, has plans for new one-story plant at Columbus, Ohio, to cost about $40,000 with equipment.

Harriman Mfg. Co., Harriman, Tenn., manufacturer of cultivators and other agricultural equipment, has been merged with W. J. Oliver Plow Co., Knoxville, Tenn., manufacturer of kindred products. First noted company name will be retained by consolidated organization. Proposed to discontinue plant at Knoxville during November, removing equipment to Harriman works which will be extended.

L. E. Lowe & Sons Machine Works, Columbus, Ohio, has been removed to 518 East Beck Street, and is in production.

St. Louis

ST. LOUIS, Oct. 1.—P. Jacks Co., 119 North Seventh Street, St. Louis, will soon begin superstructure for one-story tin and metal-working shop, 100 x 126 ft., to cost about $26,000 with equipment. Edward J. Gieseler, DeMenil Building, is architect.

Pearl Mining Co., Picher, Okla., is planning to rebuild ore mill at its Patty C zinc and lead mining properties, recently destroyed by fire, with loss of over $75,000 including machinery.

Greenleaf-Moore Cadillac Co., 1201 South Main Street, Tulsa, Okla., local representative for Cadillac automobile, is having plans completed for four-story service, repair and sales building, 100 x 140 ft., to cost approximately $125,000 with equipment. Noble B. Fleming, Commercial Building, is architect.

Eagle Aircraft Co., Kansas City, Mo., is planning an expansion program, including additional units and installation of equipment. Company is arranging for sale of 200,000 shares of stock, considerable part of proceeds to be used for work.

Board of City Trustees, Spiro, Okla., is planning extensions and betterments in municipal electric light and power plant to cost $40,000.

Missouri Pacific Railroad Co., St. Louis, is said to be planning to rebuild engine house with repair facilities at Lincoln, Neb., recently destroyed by fire, with loss of about $40,000.

City Council, Paris, Ark., is considering extensions and improvements in municipal electric light and power plant, to cost $50,000 with equipment.

Howokla Oil Co., Allen, Okla., will soon begin work on a new refinery to cost about $125,000 including equipment.

Kansas City Power & Light Co., Fourteenth Street and Grand Avenue, Kansas City, Mo., has asked bids on general contract for four-story automobile service, repair and garage building, 124 x 142 ft., to cost over $150,000 with equipment. H. G. Freshman is company architect, in charge.

Board of Education, North Little Rock Special School District, Little Rock, Ark., plans installation of manual training equipment in four-story and basement high school to cost $500,000. George R. Mann, Wanger & King, New Donaghey Building, are architects.

Pittsburgh

PITTSBURGH, Oct. 1.—The Westinghouse Electric & Mfg. Co. has issued its fourth-quarter list for machine tools and supplies; it contains 57 items and includes more machine tools than the third-quarter list. Reports about September business are somewhat mixed, but on the whole indicate that sales and money value exceeded those of August. The Timken Roller Bearing Co., Canton, Ohio, was among the buyers of the past week. In heavy equipment, the placing by the Davison Coke & Iron Co. of the mills for its new cement plant with the Allis-Chalmers Mfg. Co. is outstanding.

The Columbia Steel Corporation, which is building a six-mill tin plate plant at Pittsburg, Cal., has bought automatic doublers, shears, pickling unit and tin house equipment from Aetna-Standard Engineering Co. Mills and drives for this plant are yet to be placed.

Plans have been approved by Duquesne Light Co., 435 Sixth Avenue, Pittsburgh, for addition to steam-operated electric generating plant on Brunot's Island in Ohio River, with initial capacity of 60,000 kw. Work will include new coal tower, with equipment for unloading barges at rate of 200 tons per hr., and coal-crushing plant. Project will cost more than $6,000,000 with machinery.

Aircraft & Airways of America, Inc., Farmers Bank Building, Pittsburgh, recently organized with capital of $300,000, will act as representative for Ryan Aircraft Co., San Diego, Cal., for sales and distribution in Pennsylvania, Ohio, New Jersey and New York. Plans are under way for construction of hangar at Rodgers Field, Pittsburgh, with repair facilities. Company is also reported considering establishment of local assembling plant.

Rainbow Light, Inc., manufacturer of luminous tube electric display equipment, a subsidiary of Rainbow Luminous Products, Inc., Long Island City, N. Y., is establishing a branch plant at Pittsburgh. A similar plant will also be established at

Boston, and an expansion program carried out at Detroit plant.

Whitaker Paper Co., 101 Ninth Street, Pittsburgh, has purchased property on Beaver Avenue for new storage and distributing plant, 140 x 540 ft., to cost about $200,000 with handling and other equipment.

Kesselman & Co., 128 Ann Street, Parkersburg, W. Va., recently formed with capital of $100,000, will operate a plant to manufacture oil well equipment and supplies. William H. Kesselman, Parkersburg, is head.

Detroit

DETROIT, Oct. 1.—Baker-Perkins Co., Saginaw, Mich., manufacturer of baking machinery, has awarded general contract to James Kerns & Son, Hess Street, for one-story addition to foundry, to cost $100,000 with equipment.

O. C. Harrington Co., Jackson, Mich., manufacturer of automobile products, has taken over part of former local No. 9 plant of Earl Motors Corporation, totaling about 50,000 sq. ft. floor space, and will remodel for expansion. Another section of same plant has been secured by Watts-Morehouse Co., Jackson, manufacturer of automobile trunks, for increased production.

Stinson Aircraft Corporation, Northville, Mich., has plans for new plant, including parts and assembling divisions, for larger capacity. Company will dispose of stock issue of 23,500 shares, the majority of proceeds to be used for expansion. Edward A. Stinson is president, and Henry E. Hund, vice-president.

Consumers Power Co., Jackson, Mich., is completing plans for power substation at Saginaw, Mich., to cost about $225,000 with equipment. Company has authorized sale of new stock issue to total $9,500,000, a part of fund to be used for extensions and improvements, including transmission line construction.

Marmon-Detroit Co., 2927 Woodward Avenue, Detroit, local representative for Marmon automobile, has plans for three-story service, repair and garage building, 100 x 175 ft., to cost more than $200,000 with equipment.

Board of Education, Owosso, Mich., plans installation of manual training equipment in new two-story high school, for which bids will be asked at once on general contract. William B. Ittner, 911 Locust Street, St. Louis, is architect.

Oldberg Mfg. Co., 2661 East Grand Boulevard, Detroit, manufacturer of automobile mufflers, etc., has awarded general contract to E. A. Moldenhauer, 18442 Muirland Avenue, for one-story addition, to cost about $30,000 with equipment. Christian W. Brandt, 2111 Woodward Avenue, is architect.

Reo Motor Car Co., Lansing, Mich., has started foundations for new three-story unit, 140 x 700 ft., for manufacture of motor buses, including parts, to cost about $400,000 with machinery.

Joseph N. Smith Co., 5914 Federal Avenue, Detroit, manufacturer of automobile hardware, has asked bids on general contract for a two-story plant unit, 150 x 800 ft., to cost over $200,000 with equipment. Smith, Hinchman & Grylls, Marquette Building, are architects and engineers.

Chicago & North Western Railway Co., 226 West Jackson Boulevard, Chicago, is said to be planning new engine house, with machine shop and other units, at Iron River, Mich., to cost about $150,000 with equipment.

Nicholl Chromium Co., Inc., 3704 Mack Avenue, Detroit, has been organized to operate under patents of United Chromium Corporation in chromium plating tools, dies, bearings, etc. Company is doing both job and contract work.

Indiana

INDIANAPOLIS, Oct. 1.—Plans are being considered by Alexandria Metal Products Co., Alexandria, for one-story addition, to cost about $25,000 with equipment.

Wheeler-Schebler Carburetor Co., Inc., 1302 Barth Avenue, Indianapolis, has asked bids on general contract for three one-story additions, to cost about $65,000 with equipment. D. A. Bohlen & Son, Majestic Building, are architects.

Board of Education, Sheridan, is said to be planning installation of manual training equipment in new two-story and basement high and grade school to cost $185,000, for which bids have been asked on general contract. McGuire & Shook, 941 North Meridian Street, Indianapolis, are architects.

Showers Brothers Co., Bloomington, manufacturer of kitchen cabinets and other furniture, is reported to be planning one-story addition, to cost more than $50,000 with equipment.

C. R. Wermuth, 1036 St. Marys Street, Fort Wayne, has plans for a new one-story machine shop, 75 x 108 ft. Pohlmeyer & Pohlmeyer, Central Building, are architects.

Emge Packing Co., Fort Branch, near Evansville, contemplates installation of conveying equipment and other handling apparatus in connection with an extension and improvement program to cost about $100,000.

City Council, Muncie, will install electrically-operated pumping machinery and other equipment in a sewage disposal plant to cost $1,000,000. Pearse, Greeley & Hansen, 6 North Michigan Avenue, Chicago, are consulting engineers.

Gulf States

BIRMINGHAM, Oct. 1.—Officials of Atlas Portland Cement Co., 25 Broadway, New York, have organized a subsidiary, Atlas Portland Cement Co. of Texas, Inc., capitalized at $2,000,000, with headquarters at Waco, Tex., where 500 acres has been secured for new mill. Plans for initial units will soon be drawn, to cost more than $1,000,000 with machinery.

Forest E. Gilmore Co., Wright Building, Tulsa, Okla., is said to have plans for new gasoline refinery near Pampa, Gray County, Tex., to cost about $200,000 with equipment.

Drennen Motor Car Co., Ensley, Ala., has plans for a new service, repair and garage building, 150 x 150 ft., to cost about $140,000 with equipment.

Cities Service Gas Co., 60 Wall Street, New York, operating natural gas properties, is said to be planning construction of new gas compressor station at Higgins, Tex., to cost about $100,000 with equipment.

City Council, Bartlett, Tex., is reported planning installation of municipal electric light and power plant, to cost over $40,000 with equipment.

Farmers' Gin Co., Georgetown, Tex., is planning new cottonseed oil mill near Wharton, Tex., to cost about $75,000 with equipment. Machinery will be electrically operated.

Southern Sugar Co., Clewiston, Fla., is completing plans for new mill in Canal Point, Fla., district, with initial output of 2500 tons per day. Project will include power house, machine shop and other buildings, and will cost about $1,000,000 with equipment. Company is arranging sale of 35,000 shares of stock, no par value, part of fund to be used for new plant. B. G. Dahlberg, head of Celotex Co., 645 North Michigan Avenue, Chicago, is president.

Chevrolet Motor Co., West Grand Boulevard, Detroit, with main plant at Flint, Mich., is said to be planning new factory branch at El Paso, Tex., with repair and service departments, to cost $110,000 with equipment.

Rubber Products Co. of Alabama, Inc., Muscle Shoals, Ala., has approved plans for a new mill to cost about $100,000 with equipment.

Board of Education, Waco, Tex., has authorized installation of manual training equipment in additions to senior high school and to junior high school, for which bids will soon be asked on general contract, to cost over $300,000. T. Brooks Pearson, First State Bank Building, is architect.

Officials of Monolith Portland Cement Co., Bartlett Building, Los Angeles, have plans for new mill near Port Aransas, Tex., to cost over $1,500,000 with machinery. Company has organized a subsidiary, Monolith Gulf Portland Cement Co., to carry out project.

Board of Education, Petal, Miss., has plans for a one-story vocational school, to cost over $45,000 with equipment.

Moore-Handley Hardware Co., 25 South Twentieth Street, Tuscaloosa, Ala., has plans for new multi-story storage and distributing plant, to cost over $40,000 with equipment.

Cleveland

CLEVELAND, Oct. 1.—Machine tool sales increased the past week and inquiry for single machines is good. Business is coming largely from the automotive industry. Dealers' sales during September were in about the same volume as in the previous month. Demand for turret lathes, which fell off early in the month, took a new spurt the past week and September bookings were only slightly below August, which was an exceptionally good month.

Orders for two 30-in. geared head Niles lathes were placed during the week by Toledo Machine & Tool Co., Toledo. Firestone Steel Products Co., Akron, purchased a 3-in. radial drill, 12-in. lathe and a sensitive drilling machine. Akron Rubber Mold & Machine Co., Akron, bought a 6-in. vertical shaper.

Briggs Mfg. Co., Detroit, manufacturer of automobile bodies, has placed contracts for remodeling its Cleveland plant at Taft Avenue and East 131st Street and will again place this plant in operation. It has been shut down for three years.

Wasmer Bolt & Nut Co., Cleveland, has been organized to manufacture standard bolts and nuts and will begin operations about Jan. 1 in a new plant at 13109 Athens Avenue. Company has been incorporated with a capital stock of $125,000. John C. Wasmer, secretary Cleveland Wrought Products Co., is president; M. J. O'Donnell, formerly president Falls Rubber Co. and O'Donnell Elevator Co.,

is vice-president and treasurer; W. G. Uhler is secretary.

Mullins Mfg. Co., Salem, Ohio, has plans for enlarged capacity to permit a 50 per cent increase in production. An addition will be provided and 10 new double action presses will be installed.

Contract has been let by Cleveland Wire Spring Co., 1281 East Thirty-eighth Street, Cleveland, to Boldt Rapp, 5511 Euclid Avenue, for one-story addition, 120 x 125 ft., to cost about $80,000. George S. Rider Co., Century Building, is architect and engineer.

Easy-On-Cap Co., Cleveland, subsidiary of Eaton Axle & Spring Co., East 149th Street, has work under way on an addition to cost about $100,000 with equipment.

Maumee Valley Rubber Co., Maumee, Ohio, has authorized plans for one-story addition to cost about $25,000, and will install a 180-ton capacity press, trimming machines, boiler equipment, pumps, etc.

Western Reserve Mfg. Co., 3710 East Ninety-third Street, Cleveland, manufacturer of machinery and parts, has filed plans for one-story addition, 35 x 110 ft., to cost about $45,000 with equipment.

Winston Motor Co., Inc., Twentieth Street and Madison Avenue, Toledo, Ohio, local representative for Graham-Paige automobile, will soon take bids for three-story service, repair and sales building, 55 x 100 ft., to cost about $100,000 with equipment. Sidney Aftel, 1514 Madison Street, is architect.

Board of Education, Sixth and Rockwell Streets, Cleveland, will soon take bids for one-story vocational foundry, to cost about $40,000 with equipment.

Alliance Toy & Specialty Co., Alliance, Ohio, has changed name to Alliance Mfg. Co., and has added to its Doo-Klip line a pruner and fertilizer sprayer, and made improvements to grass shears.

Pacific Coast

SAN FRANCISCO, Sept. 27.—Plans are being drawn by Northwestern Pacific Railroad Co., 64 Pine Street, San Francisco, for new one-story car and locomotive repair shop at Tiburon, Cal., to cost about $45,000 with equipment.

Alloy Steel & Metal Co., 1862 East Fifty-fifth Street, Los Angeles, has filed plans for one-story machine shop, 65 x 84 ft., to cost about $19,000 with equipment.

Standard Pipe & Supply Co., Los Angeles, is having plans drawn for a one-story storage and distributing plant, 53 x 240 ft., with pipe cutting, threading and other departments. A 200-ft. crane runway will be installed. Unit is estimated to cost over $90,000 with equipment. Arnold A. Weitzman, Hibernian Building, is architect.

Southern California Edison Co., Los Angeles, has plans for a new equipment storage and distributing plant at Porterville, Cal., to cost about $40,000 with handling and other equipment.

Great Northern Railway Co., King Street Station, Seattle, is completing plans for a new engine house, machine shop, forge and blacksmith shop and tool shop, 116 x 450 ft., to cost about $175,000 with equipment.

George L. Barnes, Everett, Wash., has plans for a one-story brass foundry at Centralia, Wash., to cost about $18,000 with equipment.

American Ice & Cold Storage Co., foot of California Street, Everett, Wash., is contemplating three-story addition for ice-manufacturing and cold storage units, to cost about $100,000 with equipment.

Fisher Body Corporation, General Motors Building, Detroit, is said to have plans for new one and two-story plant at Emeryville, Cal., to cost about $200,000 with equipment.

Public Utilities Commission, Tacoma, Wash., Ira S. Davisson, chairman, is planning early call for bids for second unit of Cushman municipal hydroelectric power development, including water tunnel, dam, generating station and equipment, transmission lines, switching stations, etc., for which appropriation of $3,850,000 has been authorized by city council.

Canada

TORONTO, Oct. 1.—Demand for machine tools in this market is holding close to the average of the past few weeks; inquiries indicate that business for the fourth quarter will exceed that of the past three months. September sales showed improvement over those in July or August and are expected to compare favorably with any month this year. The majority of manufacturing plants are operating at better than 75 per cent of capacity. Second hand and rebuilt tools are moving more freely.

Gray Ball Bearing Co., 686 St. Clarens Avenue, Toronto, has purchased one and one-half acres at Lansdowne and Royce Avenues and will start work soon on erection of a plant to manufacture automobile parts. Operations are expected to begin before end of year.

John S. Allen, Horning's Mills, Ont., is in market for a pony planer, 16 or 20 in. x 6 in. capacity; also a 28 or 32 in. band saw.

Bids have been called by B. H. & F. Prack, architect, 606 Lister Building, Hamilton, Ont., for a one-story factory, 123 x 146 ft., on Pelham Avenue, Toronto, to cost $20,000, for W. D. Beath & Sons, Ltd., 394 Symington Avenue, Toronto, manufacturer of electric hoists, barn door tracks, steel drums, etc.

Plans for a four-story factory, 60 x 260 ft., at Toronto, for Willys-Overland, Ltd., are being revised by M. J. Streyffert, engineer, and new tenders will be called.

Hiram Walker Metal Products, Ltd., Kildare Road, Walkerville, Ont., contemplates building three additions to its plant.

F. Brown, 85 Raleigh Street, Chatham, Ont., has been awarded contract for an addition, 60 x 75 ft., to plant of Dowsley Spring & Axle Co., 81 St. George Street.

G. H. Thomas & Sons, Ltd., Dickson Street, Galt, Ont., has been awarded contract for one-story addition, 60 x 98 ft., to plant of Dominion Tack & Nail Co., Ltd., to cost $20,000. John Evans, Water Street, is architect.

Ferguson Contracting Co., Ltd., Confederation Life Building, Toronto, has been awarded contract for erection of a building at Peterborough, Ont., for Canadian General Electric Co., head office, Toronto. It will be one story, 110 x 428 ft., and will cost $150,000.

A number of sub-contracts have been awarded for erection of a machine shop at Toronto for Link-Belt, Ltd. Jackson-Lewis Co., Ltd., 1114 Federal Building, is general contractor.

Sub-trades have been let for a $350,000 plant to be erected at Mount Dennis, Ont., for Firstbrook Boxes, Ltd., 283 King Street East, Toronto. James W. Wickett Co., Ltd., 16 Saulter Street, Toronto, is general contractor.

Canadian Tube & Steel Products, Ltd., 107 Hamilton Street, Ville Emard, Que., has awarded contract for addition to its plant to Reid Brothers, 511 St. Catharine Street West, Montreal.

Dominion Bridge Co. has purchased plant of McGregor-McIntyre Structural Steel, Ltd., Toronto, one of leading structural steel concerns in Canada. Dominion Bridge Co. is building an addition to its old Toronto works and purposes to operate both plants without change.

Western Canada

Canadian Utilities, Ltd., Calgary, Alta., will build a power plant at Nokomis, Sask., and has awarded general contract to R. H. Preiss, Nokomis.

Dominion Electric Co., Shaunavon, Sask., is arranging for erection of an electric light plant at Eastend, Sask.

Town Council, Melville, Sask., contemplates installing new sewage plant, with pumps and other equipment, to cost $71,000.

Foreign

PLANS are being arranged by Pan-American Petroleum & Transport Co., 120 Broadway, New York, for new oil refinery on Island of Aruba, ex-Danish West Indies, to handle output of crude oil from local properties of its subsidiary, Lago Oil & Transport Co. Project will also include a gasoline refinery with eight cracking units, and 60,000-bbl. capacity skimming plant. Program is estimated to cost about $10,000,000. Company has begun construction of new refining plant on 60-acre tract on South Elbe River, Harburg, Germany, to cost about $2,000,000, and expects to complete this unit next spring.

Rhine-Westphalia Electric Power Corporation, Dusseldorf, Germany, known as Rheinisch-Westfalisches Elektrizitatswerk Aktien-Gesellschaft, is disposing of a bond issue of $20,000,000, in United States, a portion of proceeds to be used for expansion in power plants and transmission systems in Ruhr district.

A company at London, England, operating mining properties at Rhodesia, British South Africa, is planning extensions in plant and installation of mining and operating machinery, with new central power plant, to cost close to $1,000,000. Information at office of Bureau of Foreign and Domestic Commerce, reference England No. 73207.

Stockholms Superfosfatfabriks Aktiebolag, Stockholm, Sweden, is planning for expansion in its new nitrogen plant at Ljungaverk, to increase output of ammonium sulphate from 4000 to about 8000 tons per annum.

Central Paper Trust of Soviet Russian Government, Petrograd, is planning early purchase of machinery in United States for new Balakhna paper mill on Volga River, to an amount of about $500,000. G. G. Khramtzoff, chief engineer, and E. A. Kayatz, consulting engineer, have arrived in America for this purpose and will make headquarters at offices of Amtorg Trading Corporation, 165 Broadway, New York, official buying agency for Soviet Government.